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THE LONGEVITY OF OARSMEN

A STUDY OF THOSE WHO ROWED IN THE OXFORD AND CAMBRIDGE BOAT RACE FROM 1829 TO 1928

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The question whether strenuous exercise may lead to strain of the heart and permanent damage to that or other organs, and thus to early death, is one which has excited attention even from the earliest times. Scattered throughout the Hippocratic writings will be found several references to the athlete (of the professional or semi-professional type) and to the athletic state, and in each case we detect an attitude of doubt and suspicion as to the desirability of such pursuits when persisted in to the full. Thus in the treatise on *Nutriment*,* for example, we read: "The condition of the athlete is not natural. A healthy state is superior to all."† Galen of Pergamos, whose authority was destined to dominate medicine for centuries to come, took a stronger line. Writing in the second century A.D., in his *Paraphrase of Menodotus*,‡ better known as "The exhortation" to young men "to study the Arts," rather than to follow the profession of an athlete, he gave it as his opinion that "while athletes are exercising their profession, their body remains in a dangerous condition, but when they give up their profession they fall into a condition more parlous still; as a fact, some die shortly afterwards; others live for some little time, but do not arrive at old age. . . ." Again, he says in another place: "Athletes live a life quite contrary to the precepts of hygiene, and I regard their mode of living as a regime far more favourable to illness than to health." These pronouncements carried great weight, and were, like other Galenic sayings, no doubt accepted as correct throughout the Middle Ages, and, indeed, until much more recent times.

As a sport rowing may be said to have come into vogue in the early years of the nineteenth century, on the termination of the Napoleonic Wars (Lehmann, 1931); and the first Boat Race between Oxford and Cambridge, from Hambledon Lock to Henley Bridge, was rowed on June 10, 1829. Prophecies of evil were freely indulged in, and the Rev. Charles Wordsworth (Morgan, 1873a), afterwards Bishop of St. Andrewes, who originated the Boat Race, and who rowed four in the first race, has left it on record that "in those days we used to be told that no man in a racing-boat could expect to live to the age of 30."

Nor was this view, long held, without medical support; and in 1869 Mr. Frederick C. Skey (Morgan, 1873b), consulting surgeon to St. Bartholomew's Hospital and a Past-President of the Royal College of Surgeons, started on October 10 of that year a lively correspondence in the *Times*, dealing with the dangers to the constitution supposed to be associated with rowing, and asserting that "the University Boat Race as at present established was a national folly." A sensible leading article in the *Times* pointed out, however, that no statistical inquiry into the subject had ever been made by the medical profession, and that until this was done no firm conclusions could be arrived at. This no doubt led the late Dr. J. E. Morgan to investigate the matter, and his report we shall consider later. Since 1869, however, medical opinion has gradually changed, and physiologists and physicians now mostly hold that the danger has been greatly exaggerated, and many, perhaps most, would take the view that no young man will injure himself by rowing, provided that his organs are sound, and that he has previously undergone a proper course of training (Lewis, 1937).

But whatever individual opinion may be, the question is one which can be decided only by careful investigation along actuarial lines into the after-histories of oarsmen, so that their longevity can be determined, and be compared with that of a body of men as similar as possible in other respects but whose members have not been subjected to the strain of such violent exercise. A sidelight on the matter may perhaps be thrown by individual life histories, as, for example, those of the two well-known oarsmen who have recently passed from us, and who in their time performed wonderful feats on the river. The two referred to are Mr. Arthur Middleton Hutchinson and Mr. Stephen Fairbairn. The former, *inter alia*, rowed for Cambridge in 1881 and 1882; won the University Fours in 1880 and 1881; rowed "Head of the River" in 1880, 1881, 1882, 1883, 1884, and 1885; won the "Grand" in 1885, 1888, and 1889; and the "Stewards" in 1886 and

* *On Nutriment*, Section XXXIV, Loeb Class. Lib., **1**, 355, translated by W. H. S. Jones, Litt D.

† See also Hippocrates: (*a*) *Aphorisms*, Sect. II, Aphr. LI; (*b*) *Epidemics*, Book VI, Sect. 6, par. 2—*œuvres complètes d'Hippocrate*, E. Littré, Paris, 1846, **5**, 324; (*c*) ibid., Book VI, Sect. 4, par. 18, Littré, **5**, 312.

‡ *Œuvres de Galien*, translated by Dr. Ch. Daremberg, **1**, 38, Paris, 1854.

1889; and died in his seventy-eighth year, on December 10, 1937. The latter, Mr. Stephen Fairbairn, rowed for Cambridge in 1882, 1883, 1886, and 1887; rowed "Head of the River" in 1882, 1883, 1884, and 1885; won the "Grand" in 1885 and the "Stewards" in 1886; and in 1889 (rowing in the Victorian crew) won the Australian Interstate Race. He died on May 16, 1938, in his seventy-sixth year. Both these great oarsmen were at Jesus College, Cambridge, and apart from the numerous races referred to above it is recorded (Fairbairn, 1931) that they rowed together more than 100 times in eights and fours, and were beaten on five occasions only. In view of their dying as they did between the ages of 75 and 80, it cannot be said that their strenuous rowing had in any way affected their longevity. Suggestive, however, as such experiences may be, they must not be allowed to carry undue weight, it being arguable that athletes of this type are supermen and altogether exceptional. Nor must we forget that a reverse side of the picture exists, and that we might instance examples among famous oarsmen of early death from heart trouble; indeed, two such have recently occurred at the early ages of 50 and 62 respectively. As we have said, the matter is one which can be decided only by researches carried out on actuarial lines.

Previous Investigations

The first attempt to treat the question actuarially was made, as we have indicated, by Dr. John Edward Morgan (1873c), a physician of distinction on the staff of the Manchester Royal Infirmary, and also an oarsman of some experience, who in 1873 published his "Critical Enquiry into the After-health of the Men who rowed in the Oxford and Cambridge Boat Race from the Year 1829 to 1859." His method consisted in taking each crew separately, working out the number of years of life actually enjoyed by each member from the date of the race up to the year 1869, when the experience terminated, and then adding the years which those surviving in 1869 might expect to live, as calculated from "Dr. Farr's English Life Tables." The total number of years thus obtained for each crew was then compared with the expectation of life (according to Dr. Farr) of a man aged 20—that being the assumed age of each oarsman at the time of the race. Working on these lines Dr. Morgan concluded that, taking all the oarsmen together, each individual was "likely to survive the race on an average some forty-two instead of forty years" (the average prospect of longevity as indicated by Dr. Farr's table).

This first attempt to arrive at the truth deserves great credit; but the method, while conscientiously carried out, is open to serious criticism. In the first place, the data are inadequate, the number of lives investigated being some 200 only in all. This inadequate number was then subdivided into groups of eight, on the assumption that the conception of "expectation of life" can be applied to each minute group. But that places upon this "conception" a burden which it is not fitted to bear, since the "expectation of life," derived from the average of a large body of lives, equally demands a large group for its reasonable application. Then again, Dr. Farr's life table, which was used as a comparison, is a table based on the mortality of the general population (Censuses of 1841 and 1851), containing both healthy and unhealthy lives, and therefore not comparable to a body of select lives such as university oarsmen. The conclusion arrived at by Dr. Morgan is robbed, therefore, of much of its value.

Another research dealing with the subject is recorded in a paper by Mr. George L. Meylan (1903–4), who published the results of his investigation into the after-histories of the 152 men who rowed in the Harvard University crews from 1852 to 1892, the observations being extended up to June 25, 1903. From his research he deduced that the excess of expectation of life for each oarsman over that shown by the mortality table used for comparison was 2.88 years; and 5.09 years if allowance was made for those killed in the American Civil War. The research, however, is based on methods similar to those employed by Dr. Morgan, and is therefore open to a like criticism.

In 1937 Drs. Cooper and O'Sullivan and Mr. E. Hughes reported that of 100 men rowing for Ormond College (Melbourne) between 1885 and 1905, twenty-four were dead when the investigation ceased (in what year is not stated), as compared with an expected mortality of 31.8 of the general population, as shown by the figures of the Australian Mutual Provident Society. The number of oarsmen concerned—only 100—is, however, very small and the table of comparison not strictly comparable—a criticism which applies also to certain other communications on this subject.

A more important piece of work is that carried out by Dr. Louis I. Dublin, statistician to the Metropolitan Life Insurance Company, who in 1928 reported on the after-histories of 4,976 college athletes—from ten universities in the United States—who had engaged in the following sports: baseball (1,111), rowing (576), track-running (1,076), football (1,233), two or more sports (822), and minor sports (158). The athletes concerned had graduated for the most part between 1880 and 1905 (but a few prior to 1880), and were observed up to 1925. The after-histories of these men were then compared with the standard of mortality as revealed by the "Medico-Actuarial Table," which represents the experience of all the large life insurance companies in the United States during the years 1885 to 1909; and by the "American-Men Table of Mortality," a table which embodies a similar experience during the years 1900 to 1915. Dr. Dublin is careful, however, to point out that these tables were only employed because none more suitable for comparison was available, the insured population compared being not altogether of the same grade, physically or socially, as the college athletes. The comparison used is therefore in favour of the latter.

Briefly it may be said that, taking all athletes together, Dr. Dublin found that the actual deaths represented 93.2 per cent. of those which would have been expected on the basis of the medico-actuarial table; or 91.5 per cent. if comparison were made with the more recent American-men table. In either case the comparative results were considerably in favour of the athletes. Compared with the American-men table the various sports came out in the following order:

Sport	Number Engaged	Actual Deaths per cent. of Expected
Football	1,233	88.3
Track-running	1,076	91.8
Rowing	576	94.1
Baseball	1,111	98.0
All sports combined		91.5

Considering the rowing men in greater detail, Dr. Dublin had a group of 576 oarsmen with which to deal. Among these 576 individuals 215 deaths occurred, as compared with 228 to be expected under the American-men table of

mortality, giving the whole body a mortality of 94.1 per cent. of that expected. It is satisfactory to add that while the mortality of the oarsmen under the age of 45 was above the average, that of members of the group over 45 was distinctly lower than that expected by the American-men table, thus pointing to no excessive prevalence of degenerative diseases, cardiac or other, among oarsmen.

Taking the results as a whole, and bearing in mind the somewhat favourable basis of comparison used, it would appear that the oarsmen show a rather better expectation of life than the insured lives, the mortality being somewhat above the average for ages under 45, but below for those over that age. Dr. Dublin noted a high percentage of deaths from accidental causes among the younger men, and it may be that the excess mortality at the earlier age is in part to be explained by the more adventurous lives lived, after graduation, by the athletic type of men, and by their possession of that spirit which prompts them to take risks which others would avoid, and to seek fame and fortune in distant lands, sometimes never to return. We shall refer later to another aspect of Dr. Dublin's investigation.

It is evident from what has been said that the subject is one of some complexity and that further investigation is desirable. An opportunity for effecting this is offered by the publication of the Official Centenary History of the University Boat Race, compiled by Mr. G. C. Drinkwater, M.C. (O.U.B.C.), and Mr. T. R. B. Sanders (C.U.B.C.). This work deals with all the races rowed between Oxford and Cambridge during the years 1829 to 1929, numbering eighty-one* in all. It contains also, in an appendix, a complete "Register of Blues," in which are given details of the life of each individual oarsman, including the date of birth and, where necessary, the date of death.

Material Available for the Present Research

We have thus for investigation a group of oarsmen who, as we shall see, number 767, and whose life history is known, either completely in the case of the 394 who have died, or up to December 31, 1928 (the end of the period of observation), in the case of those then still living. Although from an actuarial point of view the data are still meagre, it was felt that some valid general deductions might be made if the period of observation covered by Dr. J. E. Morgan was thus extended to a recent date and the problem approached along somewhat different lines. The following additional details relating to the oarsmen concerned will be of interest.

In regard first to the number of individual oarsmen engaged, the figure 767 given above has been arrived at in the following manner. Eighty races between the Universities were rowed between 1829 and 1928 inclusive. From this it follows that 640 oarsmen from Oxford and a similar number from Cambridge actually rowed in the races, but in arriving at the total number of individual oarsmen allowance has to be made for those who rowed more than once.

Among the Oxford crews:

101 rowed twice during the period investigated	101
48 „ three times „ „ „	96
18 „ four „ „ „ „	54
3 „ five „ „ „ „	12
In one instance the date of death is not known; the case has therefore been excluded	1
	264

* As the period of observation terminated on December 31, 1928, we have in our investigation excluded the race rowed in 1929 and limited ourselves to the 80 races rowed between 1829 and 1928.

Hence at Oxford the number of oarsmen available for investigation out of the possible 640 was 376.

At Cambridge we have similarly to deduct:

98 who rowed twice during the period	98
46 „ „ three times „ „	92
17 „ „ four „ „ „	51
1 „ „ five „ „ „	4
In 4 cases the date of death is unknown and the cases are therefore excluded	4
Making a total of	249

Leaving 391 lives to investigate.

We have thus 376 Oxford and 391 Cambridge Blues, making a total of 767 oarsmen to consider. Of these, 431 had died before December 31, 1928, and 336 were still living. Each oarsman was included only once, and was observed from the occasion of his first race until the end of 1928, or his earlier death should that have occurred.

In the centenary history, in about eighty cases the year of birth was alone given (but not the month and the exact day). In half of these the birthdays were assumed to fall in the period January to June and the remainder in the latter half of the year, July to December. In seven further cases the date of birth was unobtainable. In these instances the oarsmen were assumed to have raced for the first time at the age of 21, except that where the date of taking the B.A. degree is given this was assumed to have occurred at the age of 21. Any errors of a year or so introduced in these few cases would have no appreciable effect on the results. It would have been interesting could we have made a comparison between those who rowed once only and those who rowed more often, but the numbers available were too few to provide actuarial results of any value. For similar reasons no useful deduction could be made by comparing the life expectancy of the ninety coxswains who steered the rival crews with that of the oarsmen concerned.

Methods of Investigation Pursued

Where a large body of lives is under observation it is possible to derive "rates of mortality" (the probability, that is to say, that a person aged precisely x years will die before reaching age $x + 1$) which show a reasonable progression from age to age, and may be compared directly with the results obtained from other similar investigations. If the number of lives observed is small, however, rates of mortality at individual ages are likely to be irregular, and a better line of approach is to compare the actual number of deaths, in groups of ages, with the number "expected" by some standard table. To do this it is necessary to construct a table of "exposed to risk"—that is, to find for each age x the number of those who during the period covered by the investigation passed through the year of age x to $x + 1$, or died during that year. (The process may be modified to apply to groups of ages.) This number, multiplied by the rate of mortality for age x derived from the standard table, will give the "expected deaths." It is this method which we have followed in the present investigation. We may add that the table of "exposed to risk" was constructed upon a "calendar-year" basis, the nearest age on December 31 in any year being taken as the exact age at that date. The lives were observed as from the date of the oarsmen's first race until December 31, 1928, due allowance being made for the fact that the lives were exposed for a part only of the calendar year of entry.

It is well known that the rates of mortality experienced by the general population of this country have improved

materially during the last century. The effect of this improvement upon *assured lives*, which probably represent the closest obtainable approximation in type to those of university graduates, has been shown by the tables published by the Institute of Actuaries. A period ending in 1863 was covered by the H^M table. The O^M table dealt with the experience of 1863–93, and there is now available the "A 1924–9" table, covering the years indicated by its title.

After consideration it was decided to investigate the experience of the university oarsmen in four periods:

(1) From January 1, 1829, to December 31, 1862
(2) „ „ „ 1863, „ „ „ 1893
(3) „ „ „ 1894, „ „ „ 1923
(4) „ „ „ 1924, „ „ „ 1928

As regards the first two periods, the most appropriate of the standard tables mentioned above to use for comparison were the H^M and the O^M respectively. Similarly, the A 1924–9 table is suitable for the last period. Period 3, including as it does the years of the Great War, presented difficulties, since, apart from the risk of death from causes immediately traceable to the war, it is known that the mortality even of the non-combatant population was considerably influenced by war conditions. In this period, although all cases were included as being exposed to "normal" risks, deaths directly due to the war (thirty-seven in number) were excluded from the "actual" deaths, which were compared with the number "expected." These "war-death" cases simply passed out of the experience at the date of death. In default of a better standard table for the investigation of the "normal" deaths of the period we employed rates of mortality midway between those shown respectively by the O^M and the A 1924–9 tables. It will be realized that an individual oarsman may appear in two or more of the periods, but not at the same ages. A man whose nearest age was 21 on December 31, 1829, for instance, might be traced up to age 54 in the first period, and from age 54 to his death in the second period, or, if he survived age 85, would appear also in period 3.

The actual numbers of lives involved in the four periods are as follows:

Period 1.—1829–62:		
First raced during period 1		231
Died		23
Surviving at end of period 1		208
Period 2.—1863–93:		
Survivors from period 1		208
First raced during period 2		262
		470
Died during period 2		110
Surviving at end of period 2		360
Period 3.—1894–1923:		
Survivors from period 2		360
First raced during period 3		227
		587
Died during period 3:		
War causes	37	
"Normal" causes	225	
		262
Surviving at end of period 3		325
Period 4.—1924–8:		
Survivors from period 3		325
First raced during period 4		47
		372
Died during period 4		36
Surviving at close of investigations		336

The total number of men entering into the investigation at any time is the sum of the items "first raced during period," and amounts, as we have said, to 767.

Results of Investigation

In the following table the actual deaths during the several periods are compared with those expected according to the appropriate standard tables, as explained above. The final column shows the actual number of deaths expressed as a percentage of the number "expected"—that is, the number which would have occurred if the oarsmen had experienced rates of mortality similar to those shown by the standard table of the same period.

TABLE I

Age Group	Actual Deaths	Expected Deaths by Standard Table	Actual as Percentage of Expected
Period 1.—1829–62. *Standard Mortality Table* H^M			
Up to 50	22	25.2	87.3
51 to 70	1	1.0	100.0
Over 70	—	—	—
All ages	23	26.2	87.8
Period 2.—1863–93. *Standard Mortality Table* O^M			
Up to 50	53	62.1	85.3
51 to 70	39	59.8	65.2
Over 70	18	21.6	83.3
All ages	110	143.5	76.7
Period 3.—1894–1923. *Standard Mortality Table Mean of* O^M *and A* 1924–9			
Up to 50	32*	40.7	78.6
51 to 70	85	98.0	86.7
Over 70	108	125.8	85.9
All ages	225	264.5	85.1
Period 4.—1924–8. *Standard Mortality Table A* 1924–9			
Up to 50	3	3.4	88.2
51 to 70	13	13.2	98.5
Over 70	20	21.9	91.3
All ages	36	38.5	93.5

* Excluding 37 Great War deaths.

An inspection of the figures shows that in each of the periods and age groups the comparison favours the oarsmen. (The age group 51–70 in period 1 has no significance in view of the paucity of numbers.) Thus, taking the lives as a whole, the actual numbers of deaths in the four periods were only 87.8 per cent., 76.7 per cent., 85.1 per cent., and 93.5 per cent. of those that would have been produced by the mortality which we have adopted as standard for the respective periods.

It must be emphasized again that these results are based upon what is, for a mortality investigation, a very small body of lives. The subdivision into age groups has been made as a matter of interest, but divergencies in the results as between one age group and another, when the figures are small, are as likely to be accidental as to be significant. Similarly, the results shown in the first period, where the "expected deaths" amount to only twenty-six, are not entitled to as much weight as those of the other periods. Subject to these reservations we may conclude that *over the whole period of the investigation the mortality experience of university oarsmen was appreciably*

superior to that of assured lives of their own generation, but that of late years this relative superiority has shown a tendency to diminish. Certainly our research gives no support to the idea that strenuous rowing in healthy subjects, when combined with adequate training, places any undue strain upon the cardiovascular or other organs and leads to any diminution of longevity.

It is not impossible, also, looking at the figures from another angle, that the mortality of oarsmen has maintained a uniform level of excellence, and that the general body of assured lives has only recently approximated to this level. This aspect of the matter is investigated in the following table, in which the actual deaths are compared with those expected, not by the standard tables applicable to the respective periods but, in all cases, by the up-to-date A 1924–9 table.

TABLE II

Period	Age Group	Actual Deaths	Expected Deaths by the A 1924–9 Table	Actual as Percentage of Expected
1	Up to 50	22	8.7	252.9
	51 to 70	1	0.5	200.0
	Over 70	—	—	—
	All ages ..	23	9.2	250.0
2	Up to 50	53	24.7	214.6
	51 to 70	39	40.8	95.6
	Over 70	18	19.9	90.5
	All ages ..	110	85.4	128.8
3	Up to 50	32*	23.3	137.3
	51 to 70	85	81.1	104.8
	Over 70	108	120.2	89.9
	All ages ..	225	224.6	100.2
4	Up to 50	3	3.4	88.2
	51 to 70	13	13.2	98.5
	Over 70	20	21.9	91.3
	All ages ..	36	38.5	93.5

* Excluding 37 Great War deaths.

From these figures it appears that at ages up to 50 the mortality standard experienced in periods 1 to 3, while superior (as shown by Table I) to that of assured lives of the same periods, was less favourable than that of to-day. At ages above 50, however, the figures do tend to bear out the suggestion made above, that university oarsmen, at any rate since the eighteen-sixties, may have enjoyed the low rates of mortality which only of late years have become applicable to assured lives generally.

Addendum

We have pointed out that in our investigation we have been obliged to compare the oarsmen with a body of men living at the same time, insured and accepted, indeed, for life insurance at ordinary rates and free from any serious blemish, but probably not possessing those advantages of physical fitness and social and economic standing enjoyed by the athletes concerned. The ideal would be to compare the life-expectancy of the oarsmen with that of their fellow graduates, living at the same period and under similar conditions except that they did not participate in such strenuous exercise. This has not been possible in our case, the necessary data not being available, since we must set aside the ninety coxswains concerned in the races as a body of lives too small to form the basis of any useful investigation.

Dr. Louis I. Dublin (1930, 1932), to whose work we have already referred, has, however, succeeded in making a comparison in the United States between athletes as a whole and their fellow graduates, and with very interesting results. He studied the life histories of 38,269 graduates from ten of the Eastern colleges in the United States (including Harvard, Yale, and Cornell) who had attended the classes from 1870 to 1905, the experience being extended to 1925. Of these 38,269 graduates 6,500 were honours men and 5,000 athletes (baseball, crews, track-running, football, etc., of whom 576 were oarsmen —see above). Taking the group as a whole (38,269) and comparing them with the American-men table of insured lives (see above), the mortality of the college graduates was 91 per cent. of that experienced by the insured group, thus showing an outlook 9 per cent. in favour of the graduates. Dr. Dublin then compared the mortality of the college graduates with that of the athletes alone and of the honours men alone, when the interesting result emerged that the honours men showed distinctly the lowest mortality. The mortality of the graduates as a whole and that of the athletes was much the same up to age 50, but above that the mortality of the athletes proved appreciably higher.

With regard to the expectation of life the investigation gave at age 22 the following result:

	Expectation
Insured men (American-Men Ultimate Table)	44.29 years
Athletes	45.56 ,,
Graduates	45.71 ,,
Honours men	47.73 ,,

These results, based as they are on considerable numbers, give, as Dr. Dublin says, food for thought, and the more so since they are not without support from the results obtained at Yale by Professors Greenway and Hiscock (1926). They would seem to indicate that although the American athlete, if healthy and properly trained, will suffer no harm from his strenuous exertion and will have an expectation of life greater than that of the ordinary healthy insured person, yet his outlook is not so favourable as regards longevity and expectation of life as that of his companions the ordinary graduates, and distinctly less so than that of the honours men. Whether this is true also for the English athlete, with his somewhat different outlook in regard to sport and games generally, and especially for the oarsmen, who form, it may be noted, only one-ninth of Dr. Dublin's group of athletes, is a question which we must leave to future research.

Dr. Dublin suggests that the athletic build and great longevity do not go hand in hand. Certainly those engaged in insurance work will agree that not infrequently it is the small and undersized individuals who live the longest. On the other hand, we must not forget the difference in temperament between the athlete and the scholar—the former leading an active life and possessing an ardent spirit, which, as we have already hinted, may drive him into enterprises and risks, not free from danger to life, which the scholar is more likely to escape. This more sheltered life led by the scholar may go far to explain the interesting observations to which we have drawn attention, and to which further research will no doubt be directed.

It is our pleasing duty to express our thanks to Mr. T. R. B. Sanders, joint editor of the *Centenary History*; to Mr. R. W. A. Fowler, A.I.A., of the Clerical, Medical and General Life Assurance Society; to Sir Adolphe Abrahams; and to Mr. H. R. Aldridge for kindly help during the progress of the work. To Dr. Louis I. Dublin of New York we are also indebted for photostat copies of original articles not

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CHRONIC URTICARIA*

BY

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The subject of chronic urticaria is one of great interest, first because its complex nature, and frequently its long duration, set a difficult problem, and, secondly, because perhaps more than any other skin condition, it brings us in close touch with general medicine. I have purposely avoided the acute cases, whether of external or internal origin, as these rarely cause any difficulty, and I am restricting this discussion to those cases of urticaria of internal origin which are already of long standing when we first see them. With regard to the final mechanism responsible for wheal formation, it is now generally believed to be due to the release of relatively large amounts of H-substance as a result of cell damage; this may be caused in several ways, of which antigen-antibody reaction is one. So far as possible I propose to consider the subject from the clinical point of view, and to base my remarks on cases which have been under my care, but it would perhaps be wise, before proceeding to this clinical study, to discuss some of the theories that have been put forward to account for the production of chronic urticaria.

Theories of Causation

It is thought that the toxin responsible for the condition may be absorbed from foci of infection in the teeth, nose, throat, lungs, gall-bladder, or urinary tract. In other cases the patient suffers from urticaria when exposed to cold, and this has been shown to be due to the presence of a dermolysin in the blood which unites with the cells at a low temperature and lyses them on rewarming, setting free H-substance. Another cause of urticaria, probably more common than one might imagine, is emotional upset. In this connexion an interesting theory has been put forward by Stokes and Pillsbury (1930), who believe that as a result of nervous strain there is a diminished secretion of hydrochloric acid in the stomach, leading to an increase in the Welch bacilli in the intestine and so to the production of a histamine-like substance, the absorption of which can give rise to the triple response. As a further result of hypochlorhydria there is diminished absorption of calcium from the food; again, diminished pancreatic and intestinal secretion leads to imperfect digestion of proteins with absorption of abnormal cleavage-products of protein from the alimentary tract, and because of this the patient may become sensitized to food and bacterial proteins. Another view is that the release of histamine as a result of antigen-antibody reaction is accompanied by emotional upset, the frequent repetition of this leading to a conditioned reflex. Thus the emotion can then itself release histamine even in the absence of the allergen.

It is also believed that the urticarial mechanism can be set in action by the products of damaged epidermal cells, and Lewis showed that a needle-prick in the epidermis can give rise to a vascular response. It is probable, however, that in perhaps the majority of cases the toxin is absorbed from the alimentary tract. In the first place the condition may be caused by allergy due to specific food sensitiveness. It has been shown by A. and M. Walzer (1927, 1928) that the protein may be absorbed unchanged into the blood stream and, reaching sensitized tissue, produce an antigen-antibody reaction. This is especially likely to occur if there is hypochlorhydria, or if the proteopexic power of the liver fails. Secondly, abnormal split-products of protein derived from food, due to deficient digestion, or products of bacterial action on proteins, may be absorbed and, escaping destruction in the liver, produce the symptoms. This will take place if the detoxicating power of the liver is at fault.

Barber and Oriel (1928), as a result of extensive biochemical investigations of the blood and urine during and after allergic attacks, came to the conclusion that there is evidence of hepatic disturbance in these cases, and that a failure of the proteopexic and antitoxic power of the liver is to some extent responsible for the condition. Oriel (1931) also found that it was possible to precipitate a proteose-like substance by adding excess of alcohol to an ether extract of the urine. He found that the amount of this proteose was greatly increased during an attack of urticaria or angioneurotic oedema. He claimed that in certain allergic diseases, including urticaria, the proteose contains the specific hapten responsible for the condition, and that when it is injected intradermally it causes a reaction similar to that produced by the allergen to which the patient is sensitized. He also showed that urinary proteose can act as an antigen, and that sensitivity can be transferred by the injection of the serum of a sensitized patient. This was carried out by the Prausnitz-Kustner technique. He believes that proteose is sometimes the primary allergen, but that in many cases it acts as a secondary allergen in patients sensitized to an exogenous substance.

Another factor which is of importance in chronic urticaria is heredity, for it is well known that in certain families there is a predisposition to urticaria, asthma, hay-fever, eczema, Besnier's prurigo, and migraine. This inherited state has been described by Coca (1926) as "atopy." I do not think that it would be profitable, in the present state of our knowledge, to discuss the views advanced by Coca to explain this hereditary tendency. An interesting theory to account for familial predisposition to allergic conditions is that put forward by Langdon-Brown (1932), who suggests that this tendency is due to absence of the ferment histaminase, which destroys histamine as soon as it is released. This view is supported by the work of Barber and Oriel, who found an increase in the amino-acids in the blood and urine in

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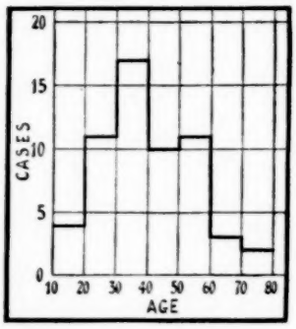
patients suffering from allergic diseases. I have already briefly referred to this work, and shall consider it in greater detail when discussing the treatment of chronic urticaria.

Present Series of Cases

I will now proceed to a clinical study of cases which have been under my care during the past few years. In fifty-eight consecutive cases seen in private and hospital practice there has been a very pronounced sex incidence, only twelve cases occurring in males, against forty-six in females. If, as Stokes suggests, emotional factors play an important part in the production of this condition, the larger number of cases in women may perhaps be accounted for. Secondly, there is quite a marked age incidence, the greatest number of cases occurring in the fourth decade. I have set this out graphically in the accompanying chart. Forty-nine out of the fifty-eight cases



occur between 20 and 60 years, and there is a sharp rise in the curve between 30 and 40 years. This is probably due in part to the incidence of focal infection being greater during these periods. Also dyspepsia is more common in middle life, while emotional and nervous strain are more likely to be present at this time. The other possible aetiological factors have been examined in thirty-three consecutive private cases, in which the methods of treatment have also been studied.

The following were the aetiological factors in this group. An allergic family history was obtained in nine cases. Focal infection in teeth (fifteen) or in the nose and throat (eleven) was present in twenty-six cases, food sensitization was present in six cases, and dyspepsia in nine. Two patients were worse when exposed to cold, one case followed an attack of influenza, while six cases were secondary to eczema and were presumably caused by the products of damaged epidermal cells. In three cases a psychological factor was discovered; in one case the condition appeared to be associated with excessive doses of thyroid, while in two cases no cause was found. In many cases more than one factor was present. It will be seen that thirty of the cases showed abnormalities associated with the alimentary tract—that is, teeth, food sensitization, and dyspepsia.

In a disease of such complexity as chronic urticaria, in which several factors may be present in any given case, it is impossible in most instances to clear up the condition by a single therapeutic measure, and I feel that it is the failure of the practitioner to realize this which is to some extent responsible for the long duration of many of these cases. The routine I have adopted may be considered under three main headings: (*a*) treatment based on aetiological factors discovered by investigation, (*b*) treatment based on theoretical considerations, (c) desensitization.

Treatment Based on Aetiological Factors

In the first place the patient is examined for evidence of focal infection, and when present this is treated, if possible. The dramatic effect that can follow the elimination of infective foci is shown in the following cases.

Case 1.—A single woman aged 27 had suffered from urticaria daily for three months. The attacks always began between 5 and 6 p.m. Her teeth had recently been reported as healthy by a dental surgeon. An attempt to desensitize her by autohaemotherapy was unsuccessful. The teeth were then radiographed, and apical infection of two of them was discovered. Their removal was followed immediately by complete recovery.

Case 2.—A married woman aged 53 had a three-weeks history of daily attacks. Apical infection of a lower bicuspid was discovered by *x*-ray examination. Three days after the removal of this tooth the condition began to clear up and recovery was complete.

The patient is asked to keep a diet chart, and to record each day in parallel columns the food and drink taken, and the state of the eruption. By omitting various articles of diet in turn for a few days it is possible to discover specific food sensitiveness when present. In cases where imperfect digestion of proteins as a result of hypochlorhydria is suspected, the administration of hydrochloric acid with meals is often effective. It would of course be best in such cases to give fractional test meals, but in actual practice, especially in private cases, this may be difficult to arrange, and one is apt to rely on the therapeutic test. It is also sometimes possible to discover psychological difficulties which may be causal factors in the production of the condition. It may be a great surprise to the patient to find that her domestic difficulties and her skin eruption are in any way related, and the recognition of the association may lead to prompt recovery even if the domestic troubles cannot be remedied. This is well shown in Case 3.

Case 3.—A married woman aged 36 had suffered from urticaria for a year. She had much domestic unhappiness, which she felt compelled to conceal and repress. There was no possible satisfactory solution of her difficulties. The relation of this to her eruption was pointed out to her, an association which she had previously failed to realize. She was also ordered glucose and whole-blood injections. Her doctor reported that he had given her three injections, but that the condition had completely cleared up after the first one. In this case the rapid recovery must be attributed to psychotherapy rather than to any physical treatment.

In cases secondary to eczema, in addition to desensitization, to which I shall refer later, the original eczematous condition must of course be treated.

Case 4.—A married woman aged 57 had suffered from generalized seborrhoeic dermatitis for three weeks. Urticarial attacks had begun shortly after the onset of the dermatitis. She stated that she had suffered from eczema and nettle rash some years previously. She was treated with local applications and whole-blood injections. After two injections she was quite free from skin disease, with the exception of dandruff.

Treatment Based on Theoretical Considerations

The second part of the treatment is based on the observations of Barber and Oriel, to which I have already briefly referred, on the changes in the blood and urine during and after allergic attacks. I am inclined to think that this work has to some extent unfortunately been overlooked as a result of the subsequent controversy as

to the specificity of the proteose which Oriel isolated from the urine, and which was said to contain the specific hapten responsible for the symptoms. In their original paper Barber and Oriel showed that just before and during an allergic attack there is a rise in the amino-acids and non-protein nitrogen and a fall in the total chlorides in the blood, while the urine shows a rise in free acidity, ammonia excretion, excretion of amino-acids and non-protein nitrogen, together with an increase in the specific gravity as a result of diminished excretion of water. The urine also shows retention of chlorides and deposition of urates on cooling. When the attack is over these changes are reversed: there is a marked diuresis and the urine becomes alkaline. They also found positive van den Bergh reactions of the biphasic type in a large proportion of their cases. They believe that these changes are indicative of a disturbance of hepatic function, and that the increased ammonia excretion and the retention of chlorides are protective mechanisms. On these findings they based the following treatment:

1. A lacto-vegetarian diet. This is advised because in many cases the antigens responsible for allergic conditions are absorbed from the alimentary tract, being specific food proteins, intermediate products of protein digestion, or toxic substances formed by bacterial action on protein.

2. Ammonia in the form of sal volatile is given because the increase in ammonia excretion is regarded as a protective mechanism.

3. Glucose is prescribed because glycogen is essential for the antitoxic and proteopexic functions of the liver.

In my cases I have not altered the patient's normal diet unless the diet chart has indicated specific food sensitiveness, when that article of diet has been eliminated. Most of my patients have been given glucose, while some have had ammonia. I have given the glucose in the form of Glucose D; this also contains calcium, which is probably of value, as some cases of urticaria show diminished blood calcium.

Desensitization

Finally, in most of the cases an attempt has been made to desensitize the patient. This has been tried in various ways. It will be remembered that Vallery-Radot and Pagniez (1916) showed that attacks of urticaria due to food can sometimes be prevented by giving the patient, about an hour before his meal, a small amount of the food to which he is sensitive. More recently Urbach and Fasel (1931) have adopted and extended the method by giving specific peptones, which they call "propeptans." In many of my cases I have used a preparation called anaclasine; this contains various peptones derived from common articles of diet, together with magnesium and sodium hyposulphites, which have also been used as desensitizing agents. Another method of desensitization that I have used extensively is intradermal injections of proteose prepared from the urine passed during or immediately after an attack of urticaria. I usually give 0.1 c.cm. of a 1 in 1,000,000 solution of proteose every five to seven days.

A further method of desensitization is autohaemotherapy. Five to ten c.cm. of blood are withdrawn from a vein and immediately reinjected intramuscularly. This method has been employed for the past twenty-five years, although its mode of action is still uncertain. In 1931–2 I carried out some experiments in order to try to throw some light on its mechanism (Burgess, 1932, 1933). My results showed that its effects do not depend on the production of leucocytosis, but that cases which were improved by the treatment had given positive reactions to their own proteoses before and negative reactions after treatment. It is therefore possible that the blood contains antigens. In other cases peptone injections were given.

Results of Treatment

The results obtained were as follows. Of the thirty-three cases treated twenty-two recovered completely, five showed considerable improvement—that is, whereas previously they had suffered from severe daily attacks they now have occasional slight attacks—two did not improve, while I have been unable to follow up four cases. Therefore, of the twenty-nine cases of which I have full records twenty-seven either completely recovered or improved considerably. In the accompanying table I have analysed the results obtained from the various methods of treatment. As one would expect, the treatment which I have included under Group *a*—that is, treatment based on aetiological factors discovered by investigation—shows the best results, in all cases being followed by complete recovery or considerable improvement. The results obtained from the treatment based on theoretical considerations (Group *b*) appear to support the theories concerned, but are not quite so good as in the first group. Desensitization (Group *c*) also proved satisfactory, although one cannot claim that the methods which theoretically should be specific give superior results to the non-specific methods.

Table showing Results of Treatment

	No. of Cases	Recovered or Improved	No Improvement	No Record
Group *a*:				
Focal infection ..	9	9	—	—
Psychotherapy ..	3	3	—	—
HCl	8	8	—	—
Totals ..	20	20	—	—
Group *b*:				
Diet	6	6	—	—
Glucose	27	21	2	4
Ammonia	8	5	1	2
Totals ..	41	32	3	6
Group *c*:				
Anaclasine	18	14	2	2
Proteose	11	8	2	1
Autohaemotherapy	13	10	—	3
Peptone	5	5	—	—
Totals ..	47	37	4	6

Conclusion

It would thus seem that there is evidence to support the theories put forward to explain the aetiology of chronic urticaria. It is clear that urticaria is a symptom rather than a disease, an end-result of many different pathological processes, and every case must be judged on its merits. The routine by which I have endeavoured to systematize, so far as possible, the investigation and treatment of these cases may be summarized as: (1) Removal of foci of infection when present. (2) Elimination of foods to which the patient is sensitive. (3) Investigation of psychological difficulties. (4) Treatment of dyspepsia when present. (5) The administration of glucose, calcium, and ammonia. (6) Some method of desensitization. If the objection be made that this method of treatment is of the "shot-gun" variety, it must be remem-

bered that in a condition of such complexity good results are only likely to be obtained by a judicious selection of various therapeutic measures in the same case.

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INDUCTION OF LABOUR

THE COMBINED METHOD OF PREMEDICATION WITH CASTOR OIL AND QUININE, AND ARTIFICIAL RUPTURE OF MEMBRANES

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Artificial rupture of the membranes as a means of inducing labour has been employed for so many years that its value as an obstetric manœuvre might well be expected by now to be precisely established. Goodwin (1937) reports its use 150 years ago, and states than Denman in 1793 was one of its earliest advocates. Yet it has not gained general approval, largely on account of the traditional association of "dry labour" with delay and difficulty. It seems possible that confusion has arisen from a failure to distinguish sufficiently clearly between the course of labour when the only abnormal feature is the early loss of liquor amnii, and the course when its escape is associated with other factors which really play the major and responsible part in producing difficulty. If the early escape of fluid could be fairly exonerated from the drawbacks for which it is commonly blamed, and if, further, its artificial production could be established as a reliable means of inducing labour, a valuable point would be reached for practical guidance. There are many situations in obstetrics where reliable control over the start and completion of labour can be calculated to lessen risk to mother and child or both. The difference in effort required to expel a foetus of, say, 6¾ lb. and one of 8 lb. may be of vital service to a woman with morbus cordis. The same difference may save the foetus where contraction of the maternal pelvis exists. Many other instances occur to the mind, of which mention may perhaps be made of the great advantage of being able to prevent gestation from continuing beyond the normal period of forty weeks.

Many opinions could be quoted both in favour of and against this method of inducing labour. A good sample in British and American literature is contained in the writings of Drew Smythe (1931), Drew Smythe and Thompson (1937), FitzGibbon (1931), Tennent (1938), Guttmacher and Douglas (1931), Jackson (1934), Wilson (1934), and Goodwin (1937). Drew Smythe (1931) recommends induction of premature labour by artificial rupture of the membranes for all cases in which the foetus presents by the vertex. He includes in his list of indications pyelitis of pregnancy, cardiac disease, and disproportion. This last condition he considers to be one above all others in which induction of labour is indicated. Eden and Holland (1937) are in favour of the method, describing it as both safe and reliable.

Indications for Induction in the Present Series

This method has been employed 681 times during the last six years at the British Hospital for Mothers and Babies, and with the experience gained, and as certain points in technique have been improved, a high appreciation of its value has grown. The cases chosen for analysis number 287, and they comprise all those in which the method has been used over a period of two years. It may be regarded as the routine policy of election at this hospital in the obstetric conditions presently to be described. The indications for induction in this series of cases were: disproportion, 100 cases; at term to prevent post-maturity, seventy-one cases; toxaemia of pregnancy, forty cases; chronic bronchitis and various states of ill-health classified as maternal debility, twenty-six cases; post-maturity, twenty-five cases; morbus cordis, seventeen cases; hydramnios and twins, five cases; ante-partum haemorrhage, three cases. Total cases 287.

Method of Induction

Once the decision to induce labour was reached the method employed was carried out in the following stages. (1) A course of early continuous premedication with sulphate of quinine. (2) Preliminary admission to hospital. (3) The use of castor oil and an increase in quinine medication. (4) Artificial rupture of the membranes followed by an immediate and deliberate expulsion of liquor amnii.

Early Quinine Medication.—All primigravidae and those multigravidae with a history of defective uterine action in previous labours received 1½ grains of quinine sulphate three times daily during the last three weeks for which the pregnancy was allowed to continue.

Preliminary Admission to Hospital.—The routine for primigravidae selected for induction was admission to hospital five days before the anticipated date of artificial rupture of the membranes. For multigravidae this period was reduced to three days.

The Use of Castor Oil and Increased Quinine Medication.—At 6 a.m., castor oil 1 oz.; at 10 a.m., 2 p.m., and 6 p.m., quinine sulphate powders 10 grains; and at 5 p.m., a simple enema and a hot bath were administered to primigravidae on the day after admission (second day) and repeated on the fourth day; to multigravidae they were given on the second day.

Artificial Rupture of the Membranes.—This was performed on the fifth day in primigravidae, and on the third day in multigravidae. The operation was carried out in the labour theatre with all the usual antiseptic and aseptic precautions. The patient being in the lithotomy position, the operator passed the first two fingers of the right hand into the vagina, and then a finger through the os until the foetal head was reached. In some cases in which the cervix was very posteriorly placed it was necessary to hook it forward with the examining finger. A long stylet or vulsellum forceps was passed along the hand into the vagina and guided through the os until it was in contact with the foetal head. The membranes were ruptured and the liquor allowed to drain off. This was

facilitated by slightly pushing up the foetal head and by abdominal pressure made by an assistant. A good flow of liquor is considered essential. Preliminary dilatation of the cervix was never required. The cervix was not exposed by a speculum previous to the introduction of the stylet or grasped with vulsellum forceps. Occasionally nitrous-oxide-and-air analgesia was used to allay nervousness in a primigravida, and on one occasion chloroform-and-ether was required. For the rest no form of anaesthetic was called for. In both primigravidae and multigravidae, if labour had not started within forty-eight hours after rupture of the membranes, the medication with castor oil and quinine powders was repeated. It is our experience that the part played by premedication in this method is of the utmost value. Preliminary contractions which are usually quite painless occur. The absence of pain in the early stages of labour in these cases is very striking. At the time of artificial rupture of the membranes it is almost invariably observed that the cervix is softened and "taken up," often completely, and in many cases there is commencing dilatation of the os.

Analysis of the Series

The following is the analysis of the series of 287 cases. Primigravidae and multigravidae are throughout grouped separately. Table I gives the *duration of the latent period*. The latent period is the time elapsing between artificial rupture of the membranes and the starting of labour.

TABLE I

Duration of Latent Period	Primigravidae		Multigravidae	
	No. of Cases	Per cent.	No. of Cases	Per cent.
0–6 hours ..	88	51.5	84	72.5
6–12 „ ..	26	15.2	13	11.1
12–18 „ ..	16	9.4	5	4.3
18–24 „ ..	5	2.9	4	3.5
24–48 „ ..	19	11.1	3	2.6
Over 48 hours ..	17	9.9	7	6
Failures	0		0	
Total	171		116	

No failures were recorded—that is, in no case was it found necessary to proceed to further surgical treatment to effect delivery. The *efficiency rate*—that is, the latent period being under twenty-four hours—was in primigravidae 78.9 per cent. and in multigravidae 91.4 per cent.

Table II summarizes the *latent period in relation to the duration of pregnancy*.

TABLE II

Duration of Pregnancy	Primigravidae			Multigravidae		
	No. of Cases	Latent Period less than 24 Hours	Per cent.	No. of Cases	Latent Period less than 24 Hours	Per cent.
30–32 weeks	2	1	50	0	0	
32–36 „	5	5	100	11	10	90.9
36–40 „	142	110	77.4	102	93	91.2
Over 40 weeks	22	19	86.3	3	3	100
Total ..	171			116		

It would appear from this table that the method is reliable during the whole of the last eight weeks of pregnancy, showing a greater efficiency in multigravidae.

Table III gives the *duration of labour* in this series.

TABLE III

Duration of Labour	Primigravidae		Multigravidae	
	No. of Cases	Per cent.	No. of Cases	Per cent.
0–6 hours ..	6	3.5	38	32.8
6–12 „ ..	58	33.9	49	42.2
12–24 „ ..	74	43.3	28	24.1
24–48 „ ..	27	15.8	1	0.9
Over 48 hours ..	6	3.5	0	
Total	171		116	

The average duration of labour was: 171 primigravidae, 16 hours; 116 multigravidae, 8 hours 17 minutes. For comparison a series of 171 normal primigravidae and 116 normal multigravidae, all of whom had spontaneous deliveries, had received no premedication, and were not induced, was collected and the average duration of labour calculated in each group. In the primigravidae it was 15 hours 2 minutes and in the multigravidae 8 hours 46 minutes. Taking into account the considerable proportion of cases in the induced series in which prolongation of labour might be anticipated—for example, in cases of disproportion—the extra duration involved is negligible, and in the case of multigravidae labour was actually shortened.

Mode of Delivery

Labour terminated in the present series as follows:

Primigravidae (171 Cases).—Spontaneous delivery, 120; delivery by forceps, fifty-one cases. The indications for forceps were: persistent occipito-posterior, nineteen cases; prolonged second stage, nine cases; prolapsed funis, one case; maternal distress, six cases; toxaemia, six cases; cardiac disease, nine cases; foetal distress, one case.

Multigravidae (116 Cases).—Spontaneous delivery, 110 cases; delivery by forceps, six cases. The indications for forceps were: maternal distress, three cases; first child born by Caesarean section, two cases; toxaemia, one case.

Foetal Mortality

Primigravidae.—There were 173 infants (two sets of twins); of these, seven were stillborn and one died. The causes of stillbirth were: post-maturity, maceration, spontaneous delivery, two cases; post-maturity, forceps delivery, two cases; hydrocephalus, one case; prolapsed funis, two cases. The cause of death in the fatal case was ante-partum haemorrhage, toxaemia, and prematurity. Of the stillbirths due to post-maturity in which there was instrumental delivery, one followed a long labour and forceps delivery. There was no disproportion. The presentation was vertex-posterior, and the head was deep in the pelvis at the beginning of labour. The other was a large (10 lb. 9 oz.) post-mature child. Of the two cases of prolapsed funis one occurred early in labour, the other at second stage. In the latter case the presentation was vertex-posterior, and prolapse of the cord occurred when manual rotation was performed. There was no disproportion in either case.

Multigravidae.—There were 119 infants (three sets of twins). Of these, one was stillborn and two died. The cause of the stillbirth was prolapsed funis; the deaths were due in one case to intracranial haemorrhage and in the other to atelectasis. In the stillbirth the cord prolapsed early in labour. There was no disproportion. The

two cases where death of the infant occurred were induced at thirty-six and thirty-seven weeks respectively on account of disproportion. Both had spontaneous deliveries. The gross foetal mortality was 3.8 per cent.; the corrected foetal mortality was 3.1 per cent.—that is, excluding hydrocephalus and ante-partum haemorrhage.

Maternal Mortality

There were two maternal deaths in this series. In one case, a primigravida induced at thirty-five weeks on account of acute toxaemia of pregnancy, the latent period was 8 hours 45 minutes, and the duration of labour 8 hours 15 minutes. She was delivered by forceps on account of her toxaemic condition. The infant weighed 5 lb. 1 oz., and did well. Uraemic symptoms appeared on the twenty-first day of the puerperium, and the patient died on the thirty-second day. In the other case, that of a multigravida, the patient had complained of headaches during pregnancy, but apart from poor general condition there were no other signs or symptoms. Labour was induced at term on account of her debility, and was spontaneous and normal, lasting 2 hours 25 minutes. The infant weighed 7 lb. 4 oz., and did well. The patient had some headache throughout the puerperium, which was afebrile; the pulse rate was 68 to 76, and blood pressure 124/90. She died suddenly on the seventh day after confinement. Post-mortem examination revealed a glioma in the region of the horn of the right lateral ventricle, enlargement of the pituitary gland, and adenomatous degeneration of the thyroid. There is obviously no connexion between these deaths and induction.

Pyrexia

In 171 primigravidae there were five cases of notifiable pyrexia (that is, a temperature of 100.4° F. recurring within twenty-four hours). These were due to urinary infection (three cases), tonsillitis (one case), and uterine sepsis following cervical laceration (one case). In 116 multigravidae there were three cases of notifiable pyrexia. These were due to influenza (febrile forty-eight hours only), two cases; uterine sepsis following exploration in a case of marginal placenta praevia and succenturiate placenta (one case). The pyrexia rate (all causes) was 2.7 per cent.; the rate in cases of uterine sepsis was 0.7 per cent.

Discussion

In the attempt to analyse the factors that influence the efficiency of the method, this series suggests that preliminary quinine medication and drug induction preceding artificial rupture of the membranes is followed by a shorter latent period than are inductions by simple rupture of the membranes. Drew Smythe and Thompson (1937) report an efficiency of 75 per cent., Tennent (1938) gives a figure of 70 per cent. in his series; in both cases no preliminary medication was administered. The higher efficiency rate of 78.9 per cent. for primigravidae and 91.4 per cent. for multigravidae reported in this paper would appear to be due to preliminary castor oil and quinine medication. Guttmacher and Douglas (1931), Jackson (1934), and Goodwin (1937) are of the opinion that efficiency of induction by artificial rupture of the membranes is increased by preliminary medication with castor oil and quinine. Wilson (1934) gives an efficiency of 80 per cent. with preliminary medication. No records were kept of the condition of the cervix or of the amount of liquor which was let off at the time of induction, but experience showed that a longer latent period was generally but not invariably to be expected where the cervix was long and where a good flow of liquor was not obtained.

In ante-natal supervision great importance is attached to the morale of the patients. Primigravidae attend a club for the purpose of social intercourse with their fellow patients and members of the staff. This promotes friendship and confidence, which greatly assists the work of the ante-natal clinics, and the good effects of overcoming apprehension are to a considerable extent already achieved in those ultimately singled out for induction. Early admission also helps towards the same end. Indeed, a familiarity with the hospital routine and personnel, and the acquaintance made of women already successfully delivered, and their babies, result in a feeling of confidence and optimism. This undoubtedly assists in obtaining the patients' co-operation throughout the stages of induction and lessens apprehension.

Conclusions

Combined premedication, drug induction, and artificial rupture of the membranes is a reliable method of inducing labour.

Labour is not appreciably prolonged by this method of induction.

Owing to the large proportion of abnormal cases in this series it is impossible to ascertain whether instrumental deliveries are increased. Practical experience indicates that this is not so.

There is no evidence that foetal mortality is increased. Prolapsed funis occurred three times, and in two of these cases artificial rupture of the membranes may have been a factor in causing the accident, though in neither case did the cord prolapse at the time of the operation. *Queen Charlotte's Textbook of Obstetrics* (1933) gives a figure of 0.89 per cent. prolapsed cord in 28,752 deliveries in sixteen years. The figure in this series is 0.7 per cent. (two cases). In cases where the head is not well approximated to or engaged in the pelvic brim there is always a possibility of this accident occurring, but its incidence in the present series does not appear to be abnormally high, and need not be taken as a contraindication to use of the method.

Providing full antiseptic and aseptic precautions are taken, the risk of sepsis is very small. Two cases of uterine sepsis occurred, of which one had had intra-uterine manipulations and one no interference beyond artificial rupture of the membranes, the cervix being lacerated in the course of spontaneous delivery.

There was no maternal death which could be attributed to induction.

Comment

It will thus be seen that our conclusions support the opinion expressed in Eden and Holland's (1937) *Manual of Midwifery*. There it is stated that rupture of the membranes is more reliable than other methods as regards certainty of onset of labour within a reasonable time, and is just as safe; and, further, that labour so induced lasts no longer and does not show a higher percentage of complications.

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TREATMENT OF LIME IN THE EYE

BY

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In the industrial processes involved in the making of lime it is necessary to take precautions to minimize the injuries which may be caused by this substance. I have already described certain measures of a prophylactic nature that have proved valuable in the protection of the skin. In this paper procedures for dealing with lime in the eye will be discussed. Some of these may be carried out in the works.

Early Measures

Lime may enter the eye in the form of very fine dust or may also be in discrete particles, which have a marked tendency to adhere to its surface. It is of great importance in first-aid work that all large particles be removed as early as possible. This may be done with a spud, a fine needle, or other suitable instrument if the doctor is at once available to use it. In most cases, however, he is not near enough to the works to be able to deal immediately with such injuries. It is therefore necessary to place in the hands of the ambulance men such equipment as gives a reasonable prospect of success with little chance of further damage from injudicious use. For this reason ambulance men have been provided with camel-hair brushes, which are smeared in a mixture of equal parts of liquid paraffin and vaselin. In the limestone country of Derbyshire climatic factors have to be kept in mind, the cold in winter being severe.

The mixture described is of such a consistency that it is neither too soft in summer nor too hard in winter. It facilitates the adhesion of small lime particles to the brush, and thus their removal. In some cases, where there is much spasm of the eyelids and photophobia with lacrimation, it is necessary to instil analgesic drops before any effective treatment can be begun. The large particles are then removed with the brush, if they can be detached from the surface of the eye without undue difficulty. The eye is then irrigated for several minutes with a warm solution from an undine. In the past boric acid solution or plain water has been popular, and all writers on this subject emphasize, and rightly, the value of free and prolonged irrigation. Before removal to hospital a little liquid paraffin is put in the eye, which is then covered with a pad and bandage or by an eye-shade as seems appropriate.

It has been observed that the folds of the upper and the lower lids are much less sensitive to the presence of lime, even if the particles are of considerable size, than is the globe of the eye. On many occasions men have reported to works medical officers complaining of slight discomfort in the eye of a few days' duration. Examination has then revealed fragments of considerable size in the folds of the upper or the lower lid, the history of the moment of entry being often vague.

A lime particle often attaches itself to the surface of the eye and, partly by chemical and partly presumably by thermal action, proceeds to burrow into the tissues. It may even become so completely sunken into these that only a small portion remains visible. When, in this manner, the surface layers have begun to close over it removal is extremely difficult. When seen in hospital or at the surgery the patient has usually received this first-aid treatment within the previous half-hour. It may suffice to verify the complete cleansing of the eye, or it may be necessary to set to work again to remove such particles as remain.

After a considerable experience of casualties of the type described I began to consider the possibility of improvement in treatment. Boric acid solutions were hallowed by usage, and it was also supposed that ammonium tartrate was very effective. In order to verify these impressions it appeared desirable to carry out some laboratory investigations. These were to determine the rate of solution of lime in different solvents which themselves should be incapable, as also any by-products formed in the process, of causing serious harm to the eye. A survey of the literature revealed that many substances had been used in the treatment of chemical eye injuries, but no exact inquiry into the rates of solution of lime appears to have been quoted.

Nature of the Injury Caused by Lime

The nature of the injury caused to the eye by lime has been a matter of dispute. Haurowitz and Braun (1922) have compared its action to that of alkaline solutions of strontium and barium. These produce a white clouding of the cornea. Other alkalis or magnesia did not bring about this effect under the same conditions, nor did neutral salts of the alkaline earths. They state that the opacity caused by lime is not due to an inorganic calcium compound, the only possible ones being the carbonate and phosphate, and these were definitely excluded. A calcium collagen compound was suspected, but they quote Mörner's experiments in which he removed the mucoid with N/10 ammonia. In such an eye, which contains only collagen, caustic lime caused no change of translucency. They were able to show that calcium was able to inhibit swelling, which power is also exerted in acid solutions. It is known that cartilage can remove calcium from calcium chloride solutions, and, since this occurs after the removal of mucoid, the opacity may be attributed to the formation of a calcium–collagen compound. It does not follow that such changes occur in the living eye. Furthermore, from experiments with the eye of a live rabbit it appeared that the lime content, while raised, returned to normal in four weeks, though the opacity persisted. It seems, then, that opacities are not due to lime–collagen compounds. Wolff (1926), however, describes particles of calcium carbonate in the cornea, which can be seen to become smaller during treatment with ammonium tartrate solution. Lime opacities are probably due to irreversible colloid changes in the mucoid, but the methods of estimating calcium in this are not delicate enough to permit exact analysis. The changes are, however, doubtless due to the calcium ions.

The reaction of lime with water may cause a rise of temperature to 300° C., which suggests that the local production of heat is responsible, at least in part, for the damage done when lime particles enter the eye. The use of a Gradenigo thermometer has shown, however, that the temperature of the conjunctival sac as a whole is not raised. Alajmo (1929) has supported the findings of Haurowitz and Braun, and states that the turbidity of the cornea is possibly due to the OH ion and the associated Ca ion. The action of the OH ion in causing swelling and liquefaction is common to all alkalis, though the opacities such as are seen with lime do not occur to the same degree with other substances of this kind.

Solvents at Present in Use

Since the salts of heavy metals have a precipitating action on protein particles from adsorption of the cation it would appear that, following the laws of chemical equilibrium, these changes should be reversible. Antonibon (1931) suggests that improvement in an established opacity is inevitably associated with the combining of the calcium in an insoluble form or in a soluble one which is but little dissociated. Alajmo had advised the use of trisodium citrate, and his favourable impressions of this, in an 8 per cent. solution, were confirmed by Antonibon, who made experiments with rabbits, using both 10 per cent. ammonium tartrate and 8 per cent. trisodium citrate. As a control one eye was irrigated with saline a minute after the lime had entered. Later on Antonibon made similar observations in man, irrigations lasting five to ten minutes being carried out four or five times a day. Opacities of different ages and of varying degree were treated. The small corneal lesions healed perfectly, no trace being detectable with the slit-lamp. In these tests the superiority of trisodium citrate as compared with neutral ammonium tartrate was very evident. Ionization with trisodium citrate has also been tried by Antonibon and likewise by Grósz (1935), who used ammonium tartrate in the same way. The results were somewhat conflicting. Other solutions that have been used in the treatment of lime in the eye are weak acetic acid, picric acid, glucose, and ammonium acetate. There is necessarily some evolution of heat when any of these come into contact with lime, and in the case of the glucose solutions the heat evolved was found to be a definite contraindication to further trial.

From what has been stated it is clear that there was need for further analytical work to determine the properties of the various possible solvents. Such work was undertaken on my behalf in the Buxton laboratories of Imperial Chemical Industries, from which the following report was issued.

Solubility of Lime in Neutral Salt Solutions

In order to obtain conditions similar to those occurring in eye treatment the apparatus used consisted of a sintered glass crucible (size 1.G.3) connected to a Buchner flask, and suction was applied in each case so that the solution washed over the lime on the filter of the crucible and passed through into the flask. The lime used throughout was prepared by crushing a lump of light-burnt reactive lime to pass a one-eighth inch mesh and be retained on a sixteenth inch mesh. Since 1 gramme of lime was employed in each test the surface of lime exposed for attack was approximately the same throughout. The solutions used were such that 1 litre of each solution was capable of dissolving half a gramme-molecule of CaO—that is, the solutions had the same dissolving power with regard to lime. Borax was the exception, since the low solubility of this substance prevented the preparation of the standard strength solution.

A burette of 100 ml. capacity, having a glass nozzle attached by rubber tubing closed by a pinch-cock, was clamped above the crucible, etc., so that the distance between the end of the nozzle and the top of the filter was two inches. Using this standard apparatus the procedure was as follows. One gramme of the prepared lime was spread uniformly over the surface of the filter in the crucible, and 100 ml. of the salt solution from the burette (with the pinch-cock full open) was run over the lime, the suction being adjusted as mentioned above. The filtrate was transferred to a beaker and the lime dissolved was determined by the oxalate method. The results obtained are given in Table I.

The figures for gm. NH_3 produced or gm. NaOH produced are the theoretical values calculated from the equation of the reaction, and really represent the percentage solution of NH_3 or NaOH which the eye must suffer during the treatment. The percentage of efficiency is 100 times the amount of CaO dissolved divided by the theoretical amount of CaO which 100 ml. of the solution is capable of dissolving in unlimited time, and disregarding the solubility of the product of the reaction. It is evident that ammonium chloride is much superior to any of the other salts tested. It dissolves 14.8 times the amount of CaO dissolved by water, or water takes 14.8 times the length of time that NH_4Cl takes to dissolve equal quantities of lime.

TABLE I.—*Solubility of Lime in Various Salt Solutions. (Volume of solution used, 100 ml. Rate of addition of solution: 100 ml./33 seconds—that is, 182 ml./min.)*

Substance	Molar Soln.	% Soln. w/v.	Gm. CaO Diss.	Gm. NH_3 Prod.	Gm. CaO Diss. per Min.	% Efficiency	Relative Value*	Time Value†
Ammon. chloride	M	5.3	0.1243	0.0755	0.2260	4.4	14.8	1.0
„ tartrate	M/2	9.2	0.0416	0.0253	0.0756	1.5	5.0	3.0
„ acetate	M	7.7	0.0409	0.0248	0.0744	1.5	4.9	3.0
„ citrate	M/3	8.1	0.0364	0.0221	0.0662	1.3	4.3	3.4
Sodium citrate	M/3	8.6	0.0330	0.0356‡	0.0600	1.2	3.9	3.8
Boric acid ..	M/3	2.1	0.0109	—	0.0198	0.4	1.3	11.4
Borax	M/6	Sat.	0.0070	0.0076‡	0.0127	0.7	0.8	17.8
Distilled water	—	—	0.0084	—	0.0144	4.9	1.0	14.8

* Solution value, relative to water. † Time of dissolving, relative to ammonium chloride. ‡ Gm. NaOH produced.

In view of the above results the solubility of lime in different strengths of NH_4Cl solution was determined. In this case the procedure was slightly altered. The solution passing through the filter was led through known quantities of standard hydrochloric acid, some of which combined with the NH_3 evolved during the reaction. The excess acid was titrated with standard alkali and the amount of CaO dissolved calculated. This quick method was found to give results comparable to the oxalate method. The results are given below.

TABLE II.—*Solubility of Lime in NH_4Cl Solutions of Different Strengths. (Volume of solution used, 100 ml. Rate of addition of solution: 100 ml./33 seconds—that is, 182 ml./min.)*

% NH_4Cl Solution	Gm. CaO Dissolved	Gm. NH_3 Produced	Gm. CaO Diss. per Min.	% Efficiency
5	0.1317	0.0799	0.2397	5.0
4	0.1143	0.0694	0.2080	5.5
3	0.0881	0.0535	0.1623	5.6
2	0.0652	0.0396	0.1187	6.2
1	0.0334	0.0203	0.0608	6.4

These results indicate practically a straight-line reduction in solubility, and that a 1.2 per cent. solution of NH_4Cl dissolves as much CaO as a 9.2 per cent. solution of ammonium tartrate, which was next best.

In order to determine the effect of rate of flow of solution on the solubility, experiments were carried out using a 1 per cent. solution of NH_4Cl (since it was indicated that 1 per cent. saline solutions are approximately isotonic with eye fluid) and different nozzles on the burette. The results are given in Table III.

TABLE III.—*Solubility of Lime in 1 per cent. NH_4Cl Solution at Different Rates of Addition. (Volume of 1 per cent. solution used, 100 ml.)*

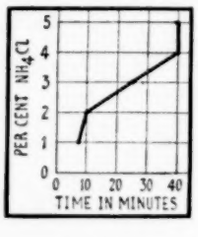
Time of Flow (sec./100ml.)	Rate of Flow (ml./min.)	Gm. CaO Dissolved	Gm. NH_3 Produced	Gm. CaO Diss. per Min.	% Efficiency
68	88	0.0491	0.0298	0.0434	9.4
33	182	0.0334	0.0203	0.0608	6.4
20	300	0.0261	0.0158	0.0783	5.0

The effect of NH_4Cl solution on limestone was also tried. Since it was expected that the rate of solution would be too slow to be measured in the above apparatus, 1 gramme of limestone crushed to pass a No. 14 B. S. sieve, and be retained on a No. 25 B. S. sieve, was mixed with 100 ml. of solution and allowed to stand for four hours, after which the lime dissolved was determined. The results obtained were:

Solution Used	Gm. $CaCO_3$ Dissolved
1% Ammonium chloride	0.0262
9.2% „ tartrate	0.0393

Assistance was also obtained from the pathological laboratory of the Devonshire Royal Hospital, from which the following report was received.

Experiment 1.—Rough time-dilution curve (see chart) for complete lysis of one drop of blood by 1 c.cm. of differing



concentrations of ammonium chloride solutions at 37° C. The curve suggests that two factors are operating—possibly hypotonicity in the low concentrations and acidity in the high ones.

Experiment 2.—A guinea-pig received ten drops of normal saline into the right eye and seven drops of 3 per cent. ammonium chloride solution (made with distilled water) into the left—both solutions at 37° C. The ammonium chloride obviously caused some smarting: the animal resisted it, but not the irrigation with saline. The eye was examined at intervals during the next two hours and showed no difference from the right eye. There was no trace of inflammation. Two days later the animal was killed for tubercle diagnosis. Both eyes were perfectly normal.

Encouraging Results with Ammonium Chloride

I then tried the effect of a 4 per cent. solution of ammonium chloride in my own eye, and found that it caused less smarting than did the solution of boric acid normally employed. Ridley gives a figure of 0.551° C. for the depression of the freezing-point of tears, and, calculated from this, tears would be isotonic with 0.85 per cent. NH_4Cl. In view of the good tolerance exhibited to stronger solutions it did not, however, appear necessary to adhere to this strength. A 4 per cent. solution of ammonium chloride was then issued to a few works for trial, the ambulance attendants being instructed to present their reports after one month. These have now been received, and are sufficiently encouraging to justify more extensive use. It has been noted that the solution tends to grow moulds if kept too long. For this reason one may add to a Winchester bottle a small quantity of preservative.

The casualties from lime burns of the eye, after transfer from the works, are treated in the local hospital. Here also the ammonium chloride solution has been used immediately subsequent to any instrumental intervention that may be needed. It is possible that the addition of a small proportion of an analgesic to the irrigating fluid might be helpful, but this will have to be tried at a later date. The removal of lime particles with an instrument is usually impossible until the eye has been anaesthetized. Moss (1936) has pointed out that ½ per cent. decicaine, which is neutral, is less painful when instilled than cocaine or butyn, which are acid in solution. It must be understood that treatment on the lines described may require supplementing by those measures which are usual when gross ulceration has occurred. It should be pointed out, however, that treatment with ammonium chloride solution need not be restricted to the first irrigation or even to the first twenty-four hours. The solution may usefully be employed even beyond this time.

When starting this work I was aware that ammonium chloride had been used in the treatment of various alkali burns of the eyes. It appeared to me somewhat surprising that little emphasis has been placed on the peculiar advantages of this solution in the treatment of lime injuries, for it is in these especially that it is most valuable.

Summary

The power of various neutral solutions to dissolve lime has been calculated by a series of experiments. It is shown that ammonium chloride is more effective than any solutions which have hitherto been generally employed. This solution in 4 per cent. strength has been tried out on a series of cases with considerable success. It is no more painful to the eye than other irrigating fluids. The preliminary application of an analgesic solution and the removal of large particles by means of a camel-hair brush dipped in a mixture of vaselin and paraffin should also form part of the first-aid treatment.

I wish to express my thanks to Mr. J. H. Gilfillan, who so kindly organized the tests made in the I.C.I. laboratories. I am also much indebted to Dr. G. L. Robinson, who made the other investigations described.

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The annual reports of the Medical Departments, Straits Settlements and Federated Malay States, for the year 1937 have just been published (Government Printing Office, Singapore, 2s. 4d.). Three races predominate in Malaya—Malays, Chinese, and Indians—and the statistics given in these reports are of especial interest when analysed by race, a point to which attention was drawn in these columns recently by Dr. I. D. Gebbie (March 4, p. 438). Thus throughout the whole area the number of maternal deaths per 1,000 live births varies from seven to ten. Among the Chinese, however, the rate is as low as 3.6 per 1,000 live births in some regions. The corresponding figure for Malays is 13 per 1,000 and for Indians in the Singapore municipal area 24.35 per 1,000. "Unhealthy traditional customs and faulty nutrition" are blamed for this high mortality. The number of lepers in settlements in Malaya at the end of 1937 was 3,807, and there were 4,494 patients in mental hospitals, most of whom were Chinese or Indian. In the Straits Settlements new cases applying for treatment for all forms of venereal disease represent 145 per 10,000 population. This does not allow for the garrison at Singapore or for patients treated privately, and should be compared with 9.8 per 10,000, which is the corresponding figure for England.

TREATMENT OF ACUTE SPRAINS BY PROCAINE INFILTRATION (LERICHE'S METHOD)

BY

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A sprain is probably the commonest sports injury, and any treatment which claims, as does that of Leriche, to reduce the period of incapacity—in the case of ankle sprains, for example, from eight or ten days to two or three—is worthy of wider recognition and trial.

Nature of Sprains

The exact nature of a sprain is not known, but the conception generally held that it is a tear in a ligament is probably wrong. Leriche has exposed sprains at operation and failed to find any such tears. He considers a sprain to be a nervous reflex following trauma, giving rise to vasomotor disturbances in the injured region. A consideration of the histology and physiology of the periarticular structures, particularly the ligaments, helps in understanding Leriche's view of a sprain (Leriche, 1927, 1928, 1930). The highly vascular nature and rich nervous network are the most striking features of the periarticular region. These nerves and sense-organs, long familiar histologically as the organs of Golgi, pacinian corpuscles, etc., are found in varying quantities in the ligaments, capsules, and tendons surrounding a joint. The precise function of each has yet to be determined, but there is no doubt that they serve to convey impulses of posture and movement—the so-called kinaesthetic sensibility—to the brain and cord. The existence of a second nerve supply in their neighbourhood (Timoféew's apparatus) suggests to Leriche and Policard (1930) a direct connexion with the sympathetic nervous system as well.

When a ligament is violently stretched or twisted these nerves are "excited" more than normally and upset the vasomotor equilibrium in their neighbourhood, presumably by afferent impulses which, passing up the cord, give rise to efferent inhibitory sympathetic reflexes, which are transmitted to the vessels in the neighbourhood of the injured joint, causing vasodilatation. This vasodilatation is responsible for the syndrome of a sprain—namely, increase in local temperature, pain, swelling, and diminished mobility. There occurs effusion of fluid containing substances which still further stimulate the nerve-endings, thus establishing a "vicious circle." The "vasomotor disequilibrium" is shown first by a transient vasoconstriction (stimulation of sympathetic), followed by an active vasodilatation (inhibition of sympathetic). These findings have been confirmed by Fontaine and Miloyévitch (1927), who, using an oscillometric method, investigated the vasomotor changes in the injured limb. In the vast majority of cases this vasomotor disequilibrium takes eight to ten days to return to normal, but in certain individuals the condition persists, giving rise to the "chronic sprain," which takes months or even years to heal, and often leads to periarticular fibrosis. Leriche considers that these individuals possess an abnormal sympathetic nervous system.

Effects of Leriche's Treatment

Working on this hypothesis of the nature of a sprain, Leriche injected an acute ankle sprain with procaine and found that the patient was relieved. He attributed the therapeutic effect of procaine to blocking of the afferent impulses, thereby breaking the "vicious circle" and permitting an early restoration of "vasomotor equilibrium." A simpler view of a sprain is that it is an axon-reflex (Policard, 1936), and that the vasodilatation follows on injury, in much the same way as in the more superficial structures, such as the skin or cornea: this view would partly account for the therapeutic effect of procaine. Nevertheless, whatever doubt there may be as to the nature of a sprain, there is no question as to the value of Leriche's treatment. This is extremely simple and practically without risk. It consists in infiltrating the periarticular tissues of the injured joint with a solution of procaine (½ to 2 per cent. may be used). In ankle sprains 10 to 15 c.cm. will suffice. Immediate relief from pain, cessation of swelling, and restoration of almost complete mobility of the joint follow the injection. Some hours later the pain returns, and takes from four to seven hours to pass off, leaving in most cases little disability in the injured joint. In a certain proportion of cases it may be necessary to repeat the injection the following day, and occasionally more than two are required. The "after-pain" is often very great, and is the only drawback to the treatment, which should therefore be confined to severe or moderately severe sprains. Campbell (1938a) has found that the injection of physiological saline solution relieves the pain, which he believes is due to the procaine itself.

Results in the Present Series

Saline injections were not tried in this series of cases; simple analgesics only were employed. Leriche advises against the use of a procaine solution containing adrenaline, as such a solution exacerbates the "after-pain." The longer duration of the pain in my series, as compared with Campbell's cases, may be due to the use of a procaine solution containing 1 in 40,000 adrenaline. The following are three typical cases.

Case 1.—A Canadian officer sustained a severe sprain of his left ankle while playing ice-hockey. He was seen three hours after the accident, when he had a moderately swollen, very painful ankle. All movements were so painful that walking was impossible. Seven c.cm. of 2 per cent. procaine were injected into the injured periarticular tissues, and within five minutes the joint became nearly painless, with almost complete freedom of motion. About three hours later pain returned, and the patient had a restless night, until pain passed off six hours later. When seen the following day the joint was almost painless and the swelling was already subsiding. The day after this he was fit for duty.

Case 2.—An airman sustained a severe sprain of his left ankle while jumping hurdles. When seen about two hours after the accident there was a moderate degree of swelling, with severe pain on moving the joint. Ten c.cm. of 2 per cent. procaine were injected and immediate relief followed. Four hours later "after-pain" occurred. The following day the joint was fully restored in function, and he was fit to resume "full duty."

Case 3.—An Australian officer sustained a severe sprain of his left ankle while playing squash rackets. He was seen ten hours after the accident, when the ankle was found to be very swollen and tender, and there was some haemorrhage under the skin below the external malleolus. All movement was painful, walking impossible. Fifteen c.cm. of 2 per cent. procaine were injected round the joint. Some hours later "after-pain" occurred, persisting for five hours, but the following day the patient was fit to resume full flying duties. In this case some slight disability remained until the subcutaneous haemorrhage was absorbed. About a year previously this officer had sustained a similar severe sprain of the same ankle, which was treated by the usual methods of

rest, lotio plumbi, etc.; he was confined to bed for twelve days, and had a further ten days on light duty. In this case the contrast in the period of invalidism is so striking as to deserve special mention.

In all, seventeen cases of acute ankle sprain and nine cases of sprain of other joints (one wrist, two finger, two thumb, two knee, and two "back") were treated during 1937 and 1938 at the R.A.F. Station, Tangmere, with similar successful results. In every case the period of incapacity was considerably less than when the more usual treatment was given. This confirms the findings of Campbell (1938a), who used Leriche's method at Dundee Royal Infirmary. Figures from Dundee Royal Infirmary and R.A.F. Station, Tangmere, are given below.

Acute Ankle Sprains Treated without Procaine

	Cases	Average Period of Incapacity
Dundee Royal Infirmary, 1936	41	..... 12.1 days
Royal Air Force, Tangmere, 1934–6 ..	12	..... 10.2 ,,

Treated with Procaine

	Cases	Average Period of Incapacity
Dundee Royal Infirmary, May–Nov., 1937	17	..... 2.8 days
Royal Air Force, Tangmere,* 1937–8 ..	17	..... 2.1 ,,

Conclusion

In conclusion it should be noted that the procaine method has wider applications than the treatment of sprains. Leriche (1937) (Leriche and Froehlich, 1936) has used it successfully in treatment of certain fractures, particularly those involving a joint where early mobilization is required, as well as in dislocations, chronic effusions, and many other conditions. Recently Campbell (1938b) has had successes with it in the treatment of ankle fractures. I have found that it gives a dramatic and lasting cure of such minor annoying complaints as "stiff neck," "fibrositis," lumbago, and vague muscular pains. The injection of a small quantity of procaine into the tender spots in the trapezius in cases of "stiff neck" results in a dramatic, almost instantaneous cure.

Summary

The mechanism of a sprain is discussed.

Leriche's treatment is described.

Three typical cases are reported, and the results in seventeen ankle sprains and nine other sprains are discussed and compared with current treatment.

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* The period is shorter, but the personnel of the Station has more than doubled since December, 1936, following expansion of the R.A.F.

The King Edward's Hospital Fund for London has made arrangements for tours of Royal Palaces and other historical buildings famous throughout the Empire. These privileged visits will take place on April 19 and 26 and May 3, 10, 19, and 26. Tickets are 7s. 6d. each visit (river trip, 10s.). Communications should be addressed to the secretary, King Edward's Hospital Fund for London, 10, Old Jewry, E.C.2.

Clinical Memoranda

Ophthalmomyiasis

The great rarity of eye infection with the larvae of flies in this country seems to warrant placing a case on record. Before proceeding to report the case recently under my care it will be relevant briefly to review the present knowledge of this condition.

Ophthalmomyiasis is rarely met with in northern countries, and I believe it to be almost unheard of in England, anyway in the last ten to fifteen years. Schenck (1930) quotes a case in Saskatchewan. In tropical and subtropical countries the larvae of flies may be deposited on the lids and in the conjunctival sac, whence they may pass into the lacrimal passage, penetrate the conjunctiva and sometimes the sclera, so gaining entrance to the intra-ocular tissues. The parasites most commonly responsible are the oestrid group: *Rhinoestrus bovis, Hypoderma bovis, Hypoderma lineata, Chrysomyia, Diptera, Sarcophaga, Gastrophilus intestinalis* larva, and *Gastrophilus equi*. Children appear to be affected more than adults. The larvae cling tenaciously to the conjunctiva and are difficult to dislodge. Anderson (1934, 1935) had a case in which the sclera was penetrated, during which process the patient had severe pain (requiring morphine for relief), became shocked, collapsed, and vomited. After entering the eye the larvae died and there was no intra-ocular reaction. Some parasites gain entrance to the eye through the lamina cribrosa and the macula. Complications such as phlyctenular keratoconjunctivitis, recurrent conjunctivitis, descemetitis, hypopyon, iridocyclitis, suppurative choroiditis, retinal detachment, optic atrophy, and increased and diminished intra-ocular pressure are mentioned in the literature. A general examination of some of these cases fails to reveal parasites in the blood or stools; there is no eosinophilia, and the spleen and lymphatic glands are not enlarged.

From the scrapings of crusts over an area of epithelial dystrophy of the cornea Wright (1927) cultured the maggots of *Aphiochaeta scalaris* (*ferruginea*) of the Phorinae group, a fly which runs rapidly and jumps but rarely flies. The larvae of this fly are small. *Rhinoestrus purpureus* is an inhabitant of horses, and is more common in Russia, Hungary, and Italy. Its larvae have been seen in the human eye. De Boe (1933) observed a dipterous larva appear at the optic disk, where its black head underwent circular movements. Within twenty seconds it had passed into the vitreous, followed by a haemorrhage; the haemorrhage passed from the optic disk across the lower part of the vitreous to the lens. Optic neuritis was present. On the second day after this event pseudopodial movements were noted in the vitreous haemorrhage and ceased on the third day. On the eleventh day after the absorption of the blood the parasite was seen suspended in the vitreous; it was composed of seven segments and a black head. On the twelfth day acute cyclitis and secondary glaucoma occurred. Later the optic neuritis cleared, but vision was totally lost. Ennema (1934) has seen subretinal dipterous larvae in the ocular tissues of a female child aged 3 in whom eosinophilia was present.

The present case was due to the larvae of the *Oestrus ovis* (*cephalomyia*), the common head-maggot fly of sheep and goats; it is greyish yellow in colour, 11 to 13 mm. long, is prevalent in June and October, and occurs in Europe and North Africa. The presence of the larvae deposited in the conjunctival sac causes intense con-

junctival hyperaemia and pain in some cases; but in others, according to Spiratos (1933), there is no conjunctival reaction at all. The dark chitinous hooks on the head of the larva cling to the conjunctiva. The larva head is 1 mm. long and has eight segments and bristle-like processes on its head and sides.

CASE REPORT

Last August a girl aged 15 came to see me. Her father, who, curiously enough, is an entomologist, stated that she had some "maggots" in her eye, and that he himself had removed three. On examining the eye I found that she had severe conjunctival hyperaemia and was in great pain. With some difficulty I removed eight "maggots" from the conjunctiva. Their mobility was amazing, and it was only possible to catch them by the girl indicating the position of the pain with her eye shut and then quickly opening it. When spotted they were very difficult to dislodge, as they clung tenaciously to the conjunctiva by the two hooks at the head. It took me about three-quarters of an hour to remove eight, and owing to the soreness of the eye I delayed any further search for about two hours, when I was able to remove another two. Next day the hyperaemia had almost subsided, and in forty-eight hours the eye was normal, and she has had no further trouble.

The girl stated that she first became conscious of a pricking in her eye while reading in the garden, some two hours before she came to see me, and that the pain gradually became worse; she was quite unaware of any fly striking her in the eye. Her father kindly searched the *Review of Applied Entomology* Section B for the last twenty-five years, and could find no cases recorded in this country of human infection with the *Oestrus ovis*.

I should like to express my thanks to Dr. Eric Biddle for his great help; also to Dr. J. W. Mackichan for identifying the larvae; and to Mr. H. B. Stallard for very kindly providing me with the known information on the subject.

J. R. B. MCBRIDE, M.R.C.S., L.R.C.P.

East Bergholt, Suffolk.

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Descent of Testes during Hormone Treatment of Acne

The following case may be of interest in view of the descent of the testicle during the treatment of acne by gonadotropic hormone.

A clerk aged 20 had suffered from acne vulgaris on the face and trunk for four years. The lesion consisted of large pustules, was most disfiguring, and, apart from making him self-conscious, produced extreme depression. Many remedies had been tried, including salts of tin, ultra-violet light, and various ointments and lotions, but the condition remained intractable to treatment. On October 10, 1938, treatment was begun with antuitrin-S, 2 c.cm. being injected intramuscularly each week. Improvement was rapid, and the patient stated that the acne was better than it had been at any time during the four years. As his face became more presentable he lost his depression and was more cheerful and self-confident. After the fourth injection he noticed a lump in his right groin, which on examination proved to be the right testicle low down in the inguinal canal. He had been under the impression that he never had a right testicle, and was certain that the lump in the groin was not present before starting treatment with antuitrin-S, a statement his father confirmed.

Treatment is being continued, and the right testicle is slowly descending into the scrotum. A slight increase in libido has been noticed, but there is no hypertrophy of the penis.

London, E.C.1. HENRY J. KINGSLEY, M.B., B.S.

Reviews

ANAESTHETICS AND SURGERY IN GENERAL PRACTICE

Treatment in General Practice. Volume III. Anaesthesia: Surgery. Articles republished from the *British Medical Journal*. (Pp. 402; 60 figures. 10s. 6d. net.) London: H. K. Lewis and Co. 1939.

This book may be read with advantage by both general practitioners and consultants, but it should prove of special value as a book of reference to those in general practice, for whom it is principally intended. The various articles are readable and essentially practical, and some of them are of a very high order. Its form in a series of chapters, each devoted to a special subject, makes it a book that may well be kept at hand, to be picked up and read in spare half-hours.

The collection into one volume of the articles on anaesthesia printed in the *British Medical Journal* is timely and well justified in view of the remarkable developments that have taken place in recent years. It will help to supplement the important work that has been done by the Association of Anaesthetists in its efforts to secure and maintain a high level in the general standard of anaesthesia in this country.

The Editor of the *British Medical Journal* and his colleagues are to be congratulated on the success with which they have carried out a difficult task and attained their object.

HUGH LETT.

MEDICAL BACTERIOLOGY

A Textbook of Medical Bacteriology. By David L. Belding, M.D., and Alice T. Marston. (Pp. 592; 47 tables; 43 figures; 1 coloured plate. 21s. net.) London: D. Appleton-Century Company. 1938.
Clinical Bacteriology. By F. A. Knott, M.D., M.R.C.P., D.P.H. (Pp. 426; 60 figures, including 12 plates. 12s. 6d.) London: J. and A. Churchill. 1939.

David L. Belding and Alice T. Marston's *Textbook of Medical Bacteriology*, produced with the collaboration of four others among their colleagues at the Boston University School of Medicine, aims at being a "concise yet comprehensive" work "intermediate between the voluminous reference books and the simple texts too elementary for medical students." Its scope and plan are certainly comprehensive; more so, indeed, than the title implies. The description of micro-organisms of medical importance, including viruses and fungi, which occupies the middle of the book, is preceded by no fewer than twenty chapters on general subjects (history, classification, bacterial physiology, infection and resistance, modes of transmission of disease, and methods), and followed by further chapters on immunity, on sanitary and economic bacteriology, and an appendix on methods. The broad outlook which characterizes some of the earlier chapters and dictated the inclusion of those on agricultural and industrial bacteriology is all to the good, but it follows that in a book of moderate size subjects of practical importance in relation to medicine have to be treated rather tersely. The streptococci are dismissed in less than seven pages, and neither Lancefield's groups nor Griffith's types of *Str. pyogenes* are mentioned. Other genera are treated in the same elementary way, and the descriptive part of the book, both for this reason and because there are no illustrations other than crude line

drawings, is inferior in value to many smaller works on the subject. The subjects of staining and cultural methods and of immunity are each dealt with in two different widely separated parts of the book; these could well be combined, and a far fuller index is needed. The chief merit of this work is that it enables medical bacteriology to be seen in its right perspective as a branch of a larger science, but it is neither a satisfactory bench book nor an adequate work of reference.

Clinical Bacteriology, by Dr. F. A. Knott, now joins an already rather numerous company of moderate-sized volumes the aim of which is to supply such knowledge of bacteriology as is required of medical students in this country. It should take a favoured place among these as a book to be read during a practical course, enabling the student to orient the immediate subject of his work in the science as a whole, and providing a restatement in a well-ordered and easily followed form of what he should have heard in lectures. The subject-matter is kept closely in touch with clinical application throughout, and it is characteristic that the chapter titles are names of diseases or "infections" with a generic adjective attached, and not names of bacterial genera. Immunity and serology are rather more fully dealt with than the purely descriptive aspect of the subject, and technique has been given a very secondary place in order the more fully to treat of principles. There are many illustrations, most of which are excellent photographs; in some which are less successful it is not clear (and nowhere stated) whether they are retouched photographs or merely drawings.

A MANUAL OF OBSTETRICS

A Glasgow Manual of Obstetrics. By Samuel J. Cameron, M.B., F.R.F.P.S., F.C.O.G., John Hewitt, M.B., Ch.B., F.C.O.G., Robert A. Lennie, M.D., F.R.F.P.S., F.C.O.G., and Ellen D. Morton, M.D., Ch.B., M.C.O.G. Third edition. (Pp. 679; 256 figures, 8 plates. 21s. net.) London: Edward Arnold. 1939.

This is an excellent book. The second edition, published in 1936, was popular, but the third deserves to create new records. Although the obstetrical teaching throughout is orthodox, it is presented with a mixture of dogmatism and authority that is both welcome and refreshing. Those sections dealing with controversial subjects, such as the treatment of pregnancy toxaemia, contain adequate reference to methods which, though widely accepted, are not used by the authors. Two chapters have been added to the previous edition. One deals with radiology in obstetrics and includes references to the more recent work on pelvimetry. The other, which gives an excellent outline of the use of physiotherapy in the puerperium, is cleverly illustrated with match-stick figures, and should do much to interest readers in an aspect of obstetrics that has been too long neglected.

The authors' belief that "the garment of truth is neither black nor white but sober gray" may be interpreted by some critics, whose ranks we would not join, as revealing the need for better illumination. To criticize minor details is not to dispute the colour of the garment, but merely to disagree with certain of its decorations. For example, why perpetuate undergraduate confusion by retaining the useless terms "lateral" and "marginal" to describe a placenta praevia? But if for any reason the terms must be retained, why not employ them in the more generally accepted way? The teaching that in cases of extreme urgency it is not essential to group blood before transfusing a patient is dangerous, and the attempt to justify it by referring to the law of averages is not convincing. In the diagnosis of foetal presentation and position it is unusual to find auscultation advised before palpation. The reverse order is more likely to encourage good antenatal diagnosis. The advisability of administering pituitrin in cases of obstetric shock is open to serious question, and the authors' confidence in the value of renal function tests in toxaemia of pregnancy will not be widely shared.

Considering the wealth of information of both a theoretical and practical nature contained in this small book the points for criticism are few. Students reading for final examinations or for higher qualifications, and practitioners who require an authoritative guide, would be well advised to consider the merits of this very excellent manual.

A TEXTBOOK OF DERMATOLOGY

Diseases of the Skin for Practitioners and Students. By George Clinton Andrews, M.D. Second edition. (Pp. 899; 938 figures. 45s. net.) London: W. B. Saunders Company. 1938.

It is now eight years since the first edition of Dr. Andrews's treatise on *Diseases of the Skin* made its appearance, and at that time we noticed that it was one of the best American textbooks on the subject. The new edition, which has been almost completely rewritten, maintains its standard. The comprehensiveness of this work is illustrated by the fact that the author has managed to find over seventy-five new diseases (*horribile dictu!*) to put in, since the last edition, but nevertheless his sense of proportion has enabled him to assign space to all the different subjects he deals with in accordance with their relative importance, and the more common dermatoses are, very properly, most fully dealt with. Not only has he added new matter in the new edition but he has discarded out-of-date methods of treatment; and theories which at one time were reasonable working hypotheses have now been replaced by knowledge based on sound experimental evidence. He has been helped by numerous able collaborators and assistants, and the whole work again forms an excellent textbook of the subject. Readers are always particularly interested in the illustrations of works on dermatology, and it is right to mention here that the numerous photographs with which Dr. Andrews's book is embellished are extremely good and adequate. There are no coloured plates, it is true, but, as we have often remarked before, illustrations in colour are sometimes less helpful than good monochromes.

MINOR SURGERY

Petite Chirurgie et Technique Médicale Courante. By G. Roux. (Pp. 591; 361 figures. 90 fr.; bound, 120 fr.) Paris: Masson et Cie. 1938.

This book, by Professor Roux of Montpellier, is the best of its kind that we have seen and should make a wide appeal to students, practitioners, nurses, hospital attendants, and others who may from time to time be called upon to carry out first-aid treatment. The text is well set out in headed sections and is clear and easily read, while the line drawings, of which there is an abundance, are excellent, and graphically illustrate, for example, such diverse but important procedures as removing a foreign body from the eye, the correct method of putting on sterilized gloves, the ways of effecting skeletal traction, and the method of reducing Colles's fracture. Sterilization, anaesthesia, blood transfusion, the arrangement of an operating unit, fractures of the nose, tracheotomy, methods of producing analgesia, artificial respiration, gastric and duodenal lavage, and venesection may be taken at random as indicative of the field covered. Not

only methods of carrying out procedures but the indications and contraindications for their performance are dealt with, so that this forms a specially valuable compact manual for the house-physician or surgeon; and, since gynaecology is included, for his colleague on the obstetric side of the hospital also. Among the illustrations of the methods of controlling haemorrhage we should like to have seen one showing the arrest of bleeding from the lingual artery by pressure of the root of the tongue against the back of the symphysis menti by the pull of the surgeon's fingers introduced into the patient's mouth. Hospital residents are sometimes unfamiliar with this valuable first-aid measure, but although it might well be added to another edition this is a very full manual in which first-aid methods are dealt with clearly and well. It is well worthy of translation into English. It can be recommended both to students first entering hospital, to whom it will form a useful introduction to hospital methods, and to the young resident who needs a guide when he himself may be called upon to perform any of the minor operative procedures. By close attention to this work difficulties which he may have had with lumbar punctures, intravenous infusions, or any of the hundred and one like procedures, should disappear, for the causes of failures often become apparent when details of correct methods are studied, and in the practice of medicine, as in everything else, success is commensurate with attention to detail.

WOMEN IN PRISON

They Always Come Back. By Cicely McCall. With a Foreword by E. M. Delafield. (Pp. 258. 7s. 6d. net.) London: Methuen and Co. 1938.

There is an ample literature about men criminals and their prisons, but very little has been written about women prisoners. Miss McCall is a psychiatric social welfare worker and holds a Commonwealth scholarship in mental health. She has spent some years in the prison service and as head mistress of an approved school. Her book is a series of impressions from her first-hand experience, with reflections based on it. It is full of common sense and disquieting reality, for she looks on prisoners as individual people. This is neither an easy nor a comfortable point of view, but it is quite indispensable to anyone who wishes to suggest reforms. She concludes that institutions at best provide an interval for convalescence. Usually, institutional treatment defeats its own ends by shutting a social misfit away from the difficulties she has been unable to face, and shirking the problem of training her to be a useful citizen. That is why she "always comes back." The book is very stimulating and well worth reading, and one is left at the end of it asking whether it is really necessary for society in its treatment of its criminals to be itself so criminally stupid.

THE SIZE OF RED CELLS

Studies on the Size of the Red Blood Cells, especially in Some Anaemias. By Erik Mogensen. (Pp. 216; 43 figures. 12s. 6d. net.) London: Humphrey Milford, Oxford University Press; Copenhagen: Ejnar Munksgaard. 1938.

This excellent book is in effect an extra-illustrated edition of *Red Blood Cell Diameters*, 1933, by Dr. Cecil Price-Jones, which described a projection method for direct measurement of red blood cell diameters expressing the results in the form of distribution curves, which is now well established as a reliable aid in the diagnosis and prognosis of anaemias. After shortly describing Price-Jones's method, Dr. Mogensen especially draws attention to the composite nature of these curves of blood diameters in pernicious anaemia (a fact which Price-Jones had pointed out in his earlier papers) and introduces a description of the mathematical procedures employed in the determination of the nature of these curves. The constant criticism of Price-Jones curves has always been the disproportional labour entailed and the time (two to three hours) required to arrive at results—factors which have tended to prohibit their general use in busy clinical laboratories—and much as the analyses of the curves may be desirable, we fear the time involved would not be lessened and these refinements would further diminish the employment of the method.

Mogensen finds that the Price-Jones curve is not specific for pernicious anaemia; it also applies to tropical and non-tropical sprue and idiopathic steatorrhoea, megalocytic anaemias which respond to liver treatment; although the type of curve is not specific for pernicious anaemia it is the result of a specific anaemic condition caused by the lack of the pernicious anaemia factor, no matter what may be the pathogenesis of the deficiency state. Mogensen considers that the relations of the Price-Jones curves of pernicious anaemia and other megalocytic anaemias to therapeutics should be investigated further in the light of recent hypothesis and observations. The author appends an interesting summary of his subject and a number of useful case records. There is a good bibliography, but no index.

Notes on Books

Dr. R. E. ILLINGWORTH'S little volume on *Chemical Analysis for Medical Students* comprises both qualitative and volumetric exercises. The qualitative part is restricted to the analytical recognition of single substances of a simple character, and very aptly describes the more characteristic reactions of common substances and the most suitable manner of applying tests for their identification. The quantitative exercises are also described very clearly and concisely. There is also an introductory explanation of precipitation reactions which is quite helpful. We only observe one sentence which is not perhaps self-explanatory. The statement that precipitation of lead sulphide "takes place even in the presence of acid which reduces the concentration of sulphide ion" should read, "although it reduces the concentration of sulphide ion." The manual is a very useful introduction to practical chemistry for medical students. It is published at 5s. by E. and S. Livingstone of Edinburgh.

We have received a copy of Jacob Henle's classical essay *On Miasmata and Contagion* (Baltimore, Johns Hopkins Press, 1 dollar), reprinted in book form from the October issue of the *Bulletin of the Institute of the History of Medicine* and translated by Dr. George Rosen. The work first appeared in 1840 in Henle's *Pathologische Untersuchungen*, and represents the first definite statement of the view that living organisms are the cause of infectious disease.

In the work entitled *Etiopatogenesi del Rachitismo* (Turin, 12 lire), which forms a supplement to *Archivio Italiano di Medicina Sperimentale*, Professor F. D. REZZESI deprecates the generally accepted actino-vitaminic theory of the aetiology of rickets as being too absolute and exclusive, and regards it rather as an obstacle to all progress in our knowledge of this disease. His own view, which is based on a study of the literature and personal experiments, is that rickets is due to several factors, which he classifies as follows: (1) pre-natal, especially parental alcoholism; (2) environment, which includes

geographical distribution, unhygienic social conditions, impure air, humidity, and cold; (3) extra-vitaminic alimentary factors, such as over-feeding, which may be the cause of rickets, while starvation tends to cure it; (4) deficiency of mineral salts, especially calcium and phosphorus; (5) upset of the acid-base equilibrium; (6) neuro-endocrine factors; (7) organic factors as represented by the spleen, liver, kidneys, and bone marrow; (8) endogenous factors; and (9) infections, especially syphilis and tuberculosis. An international bibliography of over 200 references is appended.

Sir Thomas Roddick. His Work in Medicine and Public Life, by Dr. H. E. MACDERMOT, is published by Macmillan and Co. at the price of 6s. 6d. Sir Thomas Roddick, who died in 1923, was for half a century a prominent personality in the medical and social life of Canada. As a young surgeon he introduced Listerian antiseptic methods into Montreal; the carbolic spray, then regarded as essential, is reminiscently described as thoroughly soaking everything and everybody within range and as responsible for nephritis. The group of George Ross, Roddick, and Osler at McGill in the seventies and early eighties of the last century was the finest teaching body in America. Roddick excelled in administration, as was shown in several directions. In 1885 he played an important part as Canada's first Director of Medical Services in the campaign of the Louis Riel rebellion; in 1896 he became a member of the Dominion Parliament; and in the following year was president of the British Medical Association at its meeting at Montreal, the first occasion that it went out of the British Isles. In 1912 his persuasive pleading and personal popularity won with the Roddick Bill the long-continued fight for a Dominion Medical Council and federal registration. Dr. MacDermot has collected and set out with skilful charm a great deal of interesting material.

The House of Quiet People, by BRIAN BULMAN (Hutchinson, 7s. 6d.), is a novel with an authentic ring. The theme is the "career" of a tuberculous young man. There is the usual initial haemoptysis followed by detailed narration of life in a sanatorium, easily identifiable in this case. The triangle love adds little to the interest of the book, over which hangs the gloom engendered by the view that "once tuberculous, always tuberculous." (It is refreshing to know that modern methods of treating phthisis have, at any rate in some institutions, led to a more optimistic view being taken by both patients and medical staff.) The author is a keen observer and has set out many details of personal experience faithfully. The descriptions of the delays and inconvenience caused to hospital patients during the stage of diagnosis, and of the life and thoughts of patients in sanatoria, should be of value to physicians in understanding and helping those under their care.

Dr. RENÉ BURNAND, with whom Professor Luis Sayé described "granulie froide"—the chronic type of miliary pulmonary tuberculosis—in 1920, takes a further step forward in the small volume *Les Syndromes d'Imprégnation Tuberculeuse* (Paris, Masson et Cie, 24 fr.). In this he attempts to show that, apart from such well-defined syndromes as acute and chronic miliary tuberculosis, there exist various vague forms of protracted or recurrent illnesses the tuberculous origin of which cannot generally be demonstrated bacteriologically, though on clinical grounds and in the absence of other causative agents such a presumption appears justified in Dr. Burnand's opinion. He has coined the term "patraques bacillaires" for these patients, *patraques* meaning "worn-out or sickly persons." The impression left on the mind of the reader by this little volume will be that there may be something in what the author brings forward, but that he has weakened his case considerably by accepting as "evidence" circumstances in the personal and medical history of the patient which happen to fit into his theory.

Preparations and Appliances

NIGHT SPLINT FOR KNOCK-KNEE IN CHILDREN

Mr. ERIC I. LLOYD, M.B., F.R.C.S. (Surgeon to the Hospital for Sick Children, Great Ormond Street; Orthopaedic Surgeon to the Royal Northern Hospital, Holloway), writes:

There must be many who have felt the need for an efficient night splint to control knock-knee in children. Frequently the deformity is not completely corrected by alterations to the shoes, but is not severe enough for Jones's knock-knee braces. An effective splint must extend the knee fully before lateral pressure is applied, and this is why a single lateral splint often fails to achieve anything.

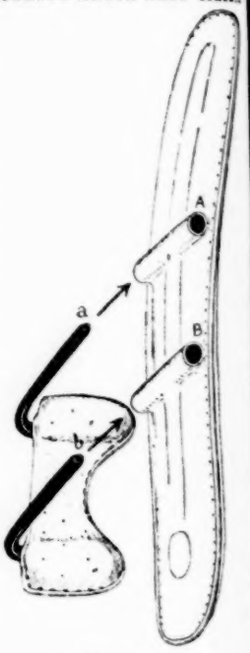

FIG. 1.

The night splint illustrated (Fig. 1) consists of two parts. The knee is first extended by bandaging it to the posterior part as shown in Fig. 2, and the lateral part is then locked into position by sliding the tubes A, B over the quarter-inch iron bars a, b. The bandage is continued round both parts of the splint, thus correcting valgus and maintaining full extension (Fig. 3). The splint has been used for three and a half years on thirty private and many more hospital patients, and it is very successful if the following points are remembered: (1) Use flannel bandages three inches wide, and do not attempt full correction at once. (2) Be careful not to pinch the child's skin when sliding the lateral part of the splint into position. (3) Warn the parent or nurse that the child must learn to sleep on his back and that he may be restless unless cold feet are avoided by warm stockings.

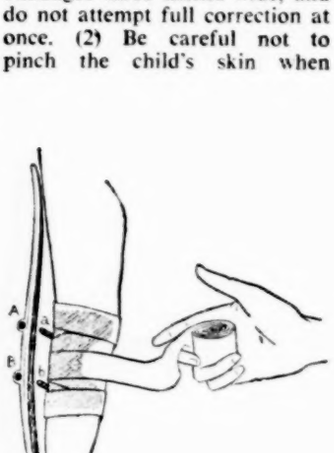

FIG. 2.

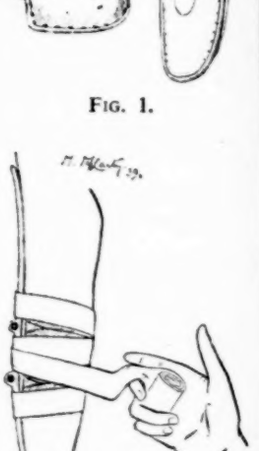
FIG. 3.

The splint may be of wood or metal suitably padded, and has been made for me by Messrs. Beckett and Bird, 8, Bentinck Street, W.1, and Messrs. Sillis Strudwick and Co., 131, Albert Street, N.W.1.

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SATURDAY APRIL 1 1939

MEDICAL RESEARCH AND AVIATION

The Secretary of State for Air, when presenting the Air Estimates for the ensuing year, informed the House of Commons that he had appointed a committee, composed of eminent scientists and medical men, including two representatives of the R.A.F. Medical Service, under the chairmanship of Sir Edward Mellanby, to investigate and advise him on the medical aspects of all matters concerning personnel which might affect safety and efficiency in flying. This is a great step forward, as medical research in aviation will now be so organized that there will be a close liaison between the Air Ministry and civil scientific and medical men. The committee contains specialists in the various medical branches concerned in aviation—namely, Professor F. C. Bartlett to deal with psychological problems, Dr. E. A. Carmichael with those of neurology, Dr. C. S. Hallpike with those of otology, Sir John Parsons with those of ophthalmology, and Professor L. J. Witts with those of medicine, while Air Vice-Marshal A. V. J. Richardson and Air Commodore H. E. Whittingham represent Service interests, the latter being the chief executive officer of the committee.

In this country the medical problems of flying were first seriously tackled during the latter part of the great war and a few succeeding years (1917–21). In this connexion the work of Bazett, Birley, Bowdler, Corbett, Dreyer, Head, Rivers,[1] and especially that of Martin Flack,[1 2] gained international recognition, and mainly as a result of their researches the present physiological tests of efficiency, collectively termed "Flack's tests," were adopted for the selection of flying personnel in the R.A.F. Since then Clements[3] studied the problem of heterophoria as it affects the aviator, with special reference to landing, and he devised means of correcting it, and was successful in 90 per cent. of cases. Livingston has perfected this eye training, which is of benefit not only to aviators but to golfers and tennis players. Clements and Livingston have materially aided the Air Ministry scientific research staff at Farnborough in the design of bomb-sights as well as the lighting of cockpits and arrangements of instruments in the instrument panel, so as to eliminate, as far as possible, ocular fatigue. In addition, Livingston[4] has studied the effect of sun-glare both at home and abroad, and the effect on eyes of pilots of flares for night landing; as a result has developed a highly satisfactory form of flying goggle and spectacle, which practically eliminates glare such as is encountered when flying over cloud and water or towards the sun, and which gives a full field of vision both in front and laterally as well as permitting binocular vision when landing. Marshall[5] has co-operated with the scientific staff in investigating the problems of high-altitude flying by means of a decompression chamber, and has been instrumental in the design of the oxygen mask and pressure suit now in use in altitude flights. Treadgold[6] in 1934, from a statistical study of the body build, together with the medical and flying histories of pilots, stated that there was a definite relation between body build and functional efficiency, and, in this connexion, that overweights were more able to endure severe or prolonged physical and mental stress than underweights; if this is so overweight should be one attribute for bomber crews.

Fatigue in aircraft crews, leading to diminished work performance, was studied by Richardson in 1935.[7] There are various factors concerned in causing flying fatigue, such as the stress of taking off and landing at high speed, the effect of noise and vibration, the mental anxiety and disorientation due to night flying or flying through cloud and fog, the discomfort of confined and cramped positions, and vitality lowered by cold at altitudes. Whittingham[8] recently, in an address at the Royal Society of Medicine, reviewed the whole subject of preventive medicine in relation to aviation. Dickson[9] has demonstrated a marked deterioration in auditory acuity for high tones in those flying regularly without helmets in enclosed cockpits, and has been working in conjunction with Ewing of Manchester University and the Air Ministry research staff at Farnborough to eliminate the ill effects of aeroplane noise on the ear. Burton and Rook in collaboration with Chambers[10] of the Industrial Research Board of the Medical Research Council have examined the present physiological tests for selec-

[1] Med. Res. Cncl. Spec. Rep. Ser., 1920, No. 53.
[2] Milroy Lectures, Royal College of Physicians, *Lancet*, 1921, **2**, 593; 637; 693; 741.
[3] *Proc. roy. Soc. Med.*, 1926, **19** (War Sect.), 15.
[4] *Brit. J. Ophthal.*, 1932, **16**, 577.
[5] *Proc. roy. Soc. Med.*, 1937, **30**, 995.
[6] *Lancet*, 1934, **1**, 1377.
[7] *Proc. roy. Soc. Med.*, 1935, **29**, 31.
[8] Ibid., 1939, **32**, 455.
[9] Official Air Min. Rep., 1938, London.
[10] Ibid., 1939.

tion for flying with reference to ability to learn to fly, and their findings suggest that there is no correlation between these tests and ability to fly. The tests, however, were designed to assess general physical fitness to withstand years of stress of flying both at home and abroad, and it is believed that they are useful for this purpose. But recent work at the R.A.F. Central Medical Establishment —the headquarters of medical research in aviation —by Williams[11] with sensorimotor co-ordinating machines and a form-relation test tends to show that these tests give definite indication of aptitude to learn to fly. In contradistinction to these laboratory tests Livingston,[12] Corner, Wallace,[13] and Dawson[14] have made observations in high-speed aircraft, especially in relation to "blacking-out" due to high centrifugal force causing temporary anaemia of eyes and brain; various means of overcoming this have been tried, but with incomplete success as yet.

The rapid advances in design and increasing complexity of modern service aircraft have led to increase in stress and strain on the human element. Future researches, therefore, must be directed to problems associated with the scientific selection of flying personnel and to measures designed to maintain their physiological efficiency. Man is as important as the machine: design of aircraft should be carried out in conjunction with physiologists, to ensure, so far as practicable, that the machine fits the man instead of trying to fit man to the machine.

THE LONGEVITY OF OARSMEN

Appropriately enough on the eve of the Boat Race —an athletic contest which for various reasons particularly lends itself to investigation and speculation—we publish an authoritative article upon the life-expectation of oarsmen. This is, of course, by no means the first attempt to assess the extent to which the effort involved in the training and physical exertion of a rowing Blue is reflected in his subsequent life-history and to ascertain whether or no undesirable results are a more or less inevitable consequence. But the present communication is of particular value and interest in the extent of its scope and the critical analysis of previous investigations. And, as one would expect when a physician and an actuary each highly experienced in his art join forces, only evidence convincing on both scientific and actuarial lines will be accepted.

As Sir Percival Hartley and Mr. Geoffrey Llewellyn point out, the first attempt to investigate the alleged dangers attendant on boat-racing was made by John Edward Morgan in 1873. Morgan, who brought to the inquiry his double qualification of clinical experience as physician to the Manchester Royal Infirmary and of practical oarsmanship, undertook a laborious research into the after-histories of the men who had competed in the University Boat Race between the years 1829 and 1869. His method of investigation is described by the present authors as open to serious criticism. The data they consider to be inadequate, the number of lives investigated being only some 200 in all—in point of fact 294—and comparable or control life-histories were not studied. It is only right, however, to recall that Morgan's investigations took place at a time when the most alarming views as to the malevolence of violent exercise had widespread acceptance; it was said that whole crews had been swept off in a few brief years by their terrific struggles and efforts at the oar, that a seat in a racing-boat was almost an invitation to suicide, and so on. Morgan's results, if they failed in complete actuarial satisfaction, must have been very reassuring to the extent that the Putney course, if not quite free from danger, was certainly not the *via mala* which it had been named. And Morgan went further. He wrote over 2,000 letters to obtain information other than the particular detail of mortality—whether the subjects of his inquiry were themselves persuaded of benefit or the reverse. Among those who responded, 115 expressed their conviction of benefit; 162 replied negatively to the effect that "they were not conscious of feeling any inconvenience from rowing"; seventeen only believed that they had sustained some sort of injury. The benefits were naturally of a general nature, though none the less interesting, such as increase of strength and stamina, increase of energy to endure, increase of power to undergo physical exertion, increase of fortitude to encounter and to submit to trials and privations and disappointments. Subsequent investigations by Meylan at Harvard and by Cooper, O'Sullivan, and Hughes at Melbourne yielded figures closely similar to Morgan's in respect to mortality; and the criticisms pertinent to Morgan are applicable to his successors.

It has to be remembered that all such investigations concern a highly selected body of men who have for actuarial purposes to be compared with another body of men, selected to some extent it is true, for they are accepted for life insurance at ordinary rates, but clearly not possessing the exceptional attributes and advantages of the athletic group. The ideal, according to Sir Percival

[11] Official Air Min. Rep., 1939, London.
[12] *Brit. J. Surg.*, 1939 (being published in next edition).
[13] M.D. Thesis, Glasgow University, 1938.
[14] *Lancet*, 1938, **2**, 1503.

Hartley and Mr. Llewellyn, would be to compare the life-expectancy of the oarsmen with that of fellow undergraduates living under similar conditions except that they did not participate in such strenuous exercise. But, even so, would not the objection arise that the university eight, representing the very flower of British physique, selected through the highest grade of multiple competitions, would be in any circumstances incomparable? Such an attempted comparison between athletes as a whole and their fellow graduates who may be classed as "scholars" has been made by Dr. Louis L. Dublin in the United States, with results which appear to indicate that although the American athlete if healthy and properly trained will suffer no harm from his strenuous exercise and will have an expectation of life greater than that of the ordinary healthy insured person, yet his outlook is not so favourable as that of the ordinary (non-athletic) graduate. The question is raised whether such a result would be discovered were a similar investigation applied to English athletes; but, as Sir Percival and his collaborator point out, we have to bear in mind the difference in temperament between the athlete and the scholar. The more sheltered life of the scholar would protect him from certain enterprises and risks not free from danger to life which the ardent spirit of the athlete is likely to invite. Had any of these investigations revealed a striking result to the disadvantage of the oarsmen an indictment against violent exercise would have been justified as a prima facie case. But as the authors of the present article conclude, there is no support for the idea that strenuous rowing in healthy subjects places any undue stress upon the cardiovascular or other organs and leads to any diminution of longevity.

It is interesting to speculate what precisely is envisaged as the pathological condition resulting from strenuous exercise likely to reduce the expectation of life. It is not difficult to see why some suspicion of ill results should arise. The undertaking appears to be in itself unnatural; support to any forebodings is afforded by contemplation of the athlete's expression and attitude of distress, exhaustion, and occasionally collapse, although the spectator may rarely have the opportunity to observe to what extent such appearances may be deceptive and how soon recovery occurs. On the physiological side it is recognized that respiration is impeded through the limitation to short jerky inspirations and expirations at each stroke; that the heart rate is increased by perhaps 300 per cent. to maximum frequency for some twenty minutes; and that if laboratory investigations are performed it will be found that during this time each ventricle pumps thirty-four litres of blood a minute (eight times its resting output) and that an "oxygen debt" of nineteen litres may be incurred, corresponding to a concentration of lactic acid of 0.35 per cent. Such figures encourage the expectation of "strain" of some kind, and particularly of the heart, although there appears to be no doubt that with the healthy organ—and in regard to the subjects under consideration there can be no question of integrity of tissue—there is a margin of reserve, notwithstanding the most strenuous exertion possible to any human being. The heart represents the central fortress of the organism, the defending position and outposts being provided by the nervous system and its servants; it is protected by the earlier breakdown of less vital structures. Yet strain might be visualized in another way: not as immediate or permanent disablement but in a more subtle fashion, remaining latent to manifest itself in later life. Any such notion demands the assumption of certain hypotheses for which proof would not be forthcoming, whether on the structural, the biochemical, or the nervous side. But there is at least something to be said for the idea. When R. H. Culme-Seymour, who stroked Oxford to a dramatic victory in 1901, died the following winter of pneumonia his exceptional effort earlier in the year was recalled as a possible cause of lowered resistance. The development of pulmonary tuberculosis in athletes has provided a similar indictment. More than one great athlete has expressed his opinion that he was never the same man after an exceptionally gruelling experience when exertion, anxiety, and exposure to cold were combined. A reduction in life-expectation would transfer the idea of strain from the cardiovascular system, with which it is traditionally identified, to the body as a whole. But so far as the heart is concerned, were strain, presumably of a mechanical nature, in fact possible, one would look for it in feats of the most extreme exertion necessarily performed for a very short time. Granted enough determination, an experienced oarsman who could last the Boat Race course at the usual speed could row himself to a standstill in a couple of minutes; and from this aspect a quarter-mile race might be more deleterious than a Marathon of 26¼ miles at ten miles an hour. Sir Adolphe Abrahams, who has applied himself to the observation of track athletes at all distances, is of opinion that no evidence of "cardiac strain" is forthcoming and that the only danger to a healthy subject that can result from exercise is heat-stroke—for example, through prolonged exertion under conditions particularly unfavourable to heat loss, a danger which certainly does not arise in the case of the Oxford and Cambridge Boat Race.

L.C.C. HEALTH SERVICES ON SHOW

When a London surgeon who is mayor of a metropolitan borough said the other day that his occupation was surgery but his hobby was municipal government there were some smiles in his audience, for municipal government is regarded as a duty or a discipline but hardly as a recreation. Yet the London County Council during its jubilee celebrations managed to pictorialize its services in a way that proved highly popular. Never in the history of cities has such an exhibition been staged as the one that filled twenty-five rooms of County Hall. One part of the Council's work of which the public sees very little was brought well to the fore—namely, the mental health services. The space was mostly devoted to the surprisingly clever work mental patients can turn out. The difference between the clothing worn by patients fifty years ago and to-day was brought out in a series of lay figures, and the grim show cases illustrating instruments of restraint were produced only to emphasize the humaneness of to-day in contrast with the rigour of an earlier time. But the mental health department went further and described for the public benefit the story of the treatment of general paralysis by induced malaria. The exhibit, like the pathological one in the hospitals section, took for granted a considerable knowledge of modern medicine on the part of the public. Visitors were presented with an excellent pamphlet setting out the story of research on general paralysis from the time of John Haslam's description in 1798 to the recent work of Wagner-Jauregg in Vienna, which has changed the outlook in the treatment of this condition. Since 1923—the year after the first patient was inoculated with malaria in England—the treatment has been a feature of the practice of the L.C.C. mental hospitals. In 1937 the treatment became concentrated so far as possible at Horton. Here, with the co-operation of the Ministry of Health, a centre has been established in a detached villa where the anopheles mosquitos are bred and infected for the transmission of malaria to general paralytic patients, including if necessary cases in mental hospitals outside the London service. The centre comprises a laboratory in which malaria itself is studied intensively, and a treatment block in which the patients undergoing malarial therapy are accommodated.

In the several rooms of the exhibition devoted to the hospitals and medical services of the Council a feature was made of the mechanical respirators. These were shown in four types—namely, the Drinker, the Bragg-Paul, the Both, and the "cuirasse"—and some of them were illustrated in operation on models. The Council's medical officer of health and his staff have played a pioneer part in the development of these respirators, which have saved many lives in the Council's hospitals and in hospitals elsewhere to which they have been sent. Probably in no other place in the world could this collection of apparatus have been seen and demonstrated. Another exhibit illustrated the development of the ambulance. The L.C.C. is fortunate in possessing photographic records of all the early forms of ambulances, and it was possible to trace the progress in ambulance construction over the last half-century or so, from what was really an old London "growler" to the vehicle which seems to be the last word (though it may not be) in ambulance facility at the present time. The London ambulance service will be tested to the uttermost in the dire event of war, but for peace-time it is a wonderfully efficient fleet. The vehicles available number 153. It is proposed that forty-seven of these, which at present are fitted to carry two stretchers only, shall be converted to take four stretchers each, and in addition sixteen of them require adaptation to take the all-metal stretchers supplied by the Home Office for use in emergency. The ambulances carry 372,000 patients and travel two million miles a year. The latest aspect of the work of local authorities, that of air raid precautions, was also exemplified at County Hall, with some relics of the air raids on London which took place in 1916–18 and a pictorial representation of the Council's duties in this field. These duties are the organization of emergency fire and ambulance services and of rescue and demolition parties, the repair of the main drainage system, certain evacuation arrangements, and, not least, co-operation with the Ministry of Health in providing hospital accommodation and medical staff and supplies for dealing with civilian casualties. There was much else in the exhibition of very great importance, especially the education section. It will have served its purpose in making clear that an enlightened local government is not merely an efficient machine but a living organism.

POLIOMYELITIS VIRUS IN THE BOWEL

Owing to the expense entailed in the use of monkeys, the virus of poliomyelitis has never been followed closely in its migrations from person to person, and even its distribution and persistence in the body of the individual case are imperfectly known. Of 535 attempts to recover the virus from the nasopharynx collected from the literature by S. D. Cramer, B. Hoskwith, and L. H. Grossman[1] only sixty-four gave positive results, and in only fourteen of these was the disease transmitted from the first to a second animal. Of 144 attempts to recover

[1] *J. exper. Med.*, 1939, **69**, 49.

the virus from the faeces or intestinal contents, fifty-one resulted in takes, but further passage is recorded in only four; since there are apparently toxic substances in faecal extracts even when there are not actually living bacteria, these fifty-one findings may well include some false positives. Cramer and his colleagues have themselves undertaken a study of this subject and present the results of attempts to demonstrate the virus in nasal washings and faeces of twenty patients convalescent from poliomyelitis and of seven monkeys at the height of the disease. A total of sixty-one inoculations gave five positive results, the sources of the material being a human nasopharynx in two, human faeces in two, and monkey intestinal contents in one. The authors are particularly interested in the occurrence of the virus in the bowel, which they believe to be more frequent than has hitherto been known, perhaps owing to the use of imperfect methods for demonstrating it. They argue that since the virus is certainly in the nasopharynx it must be swallowed, that it evidently can withstand the action of gastric juice, and that the bowel may act as a "reservoir" for it. If this implies that the virus multiplies or accumulates there, the available facts do not seem to warrant this conclusion. But it is very properly pointed out that the disposal of excreta from cases of poliomyelitis demands care which is probably not often accorded to it. Although they suggest that the source of infection may sometimes be excremental, these authors do not on that account relinquish or even modify the belief that the actual portal of entry is in the upper air passages. It will be recalled that G. O. Barber[2] recorded recently in this *Journal* four simultaneous cases of poliomyelitis in one house of a school, and after considering and rejecting all other and more orthodox possibilities reached the conclusion that the most likely source of infection was a consignment of strawberries from an area where the disease was prevalent. He argued, further, that the distribution of poliomyelitis is more consistent with its being conveyed by food than with the usual assumption that it is air-borne, while its usual prevalence at a time of year when the consumption of fresh fruit is at its maximum lends support to the same idea. This is a hypothesis which should certainly be borne in mind in studying the spread of the disease in future epidemics.

CHANGES IN THE REFRACTION OF SCHOOL CHILDREN

The study of the visual acuity and refractive errors of school children is a matter of importance, since it has long been shown that educational methods have a strong effect on both these conditions. A detailed investigation on these matters was made in this country by the Board of Education, of which the results were published in 1931.[3] Now the results of a similar investigation come from the United States of America.[4] The work began in 1924. A number of children had their eyes investigated by retinoscopy under a mydriatic, and there have been re-examinations of these children at later dates. In all, 1,481 white school children were examined twice with an interval of two and a half years. It was found that the proportion showing emmetropia and mixed astigmatism did not alter. The frequency of hypermetropia was reduced by almost 20 per cent. The cases of hypermetropic astigmatism increased by about 40 per cent. The frequency of myopia and myopic astigmatism increased by about 70 and 65 per cent. respectively. Observations were also made as to the ages at which these changes were most common. It was found that the incidence of new cases of myopia tends to increase slightly for each age group up to that of 10–11 years and then declines for the successive age groups. Between 10 and 13 years of age, on the average, a myopic condition developed in 5 per cent. of the children. After the age of 14 new cases developed in only 1.3 per cent. For astigmatism the pattern of age-specific incidence is different: new cases occur more frequently for the 6–7 year class and for the 12–13 year age class than for other age groups. As in the case of myopia, the age 14 and over represents the period of minimum incidence of new cases of astigmatism.

[2] *British Medical Journal*, 1938, **2**, 1137.
[3] Report of the Committee of Inquiry into Problems Connected with Defective Vision in School Children. 1931. London: H.M. Stationery Office.
[4] *Changes in the Types of Visual Refractive Errors of Children.* By Antonio Ciocco. United States Treasury Department, Public Health Service, Washington. 1938. (5 cents.)

RENAL PRESSOR SUBSTANCE

We have previously referred[1] to the possible part played in human and experimental hypertension by renin, the renal pressor substance first described by Tigerstedt and Bergman in 1898. There can be little doubt that the hypertension following constriction of the renal artery results from the release by the ischaemic kidney of a pressor substance into the circulation. This hypothesis has now received direct proof in the experiments of Fasciolo, Houssay, and Taquini.[2] These workers have shown that transplanting an ischaemic kidney from a hypertensive dog into the neck of a nephrectomized dog under chloralose anaesthesia raises the blood pressure of the latter by 30 to 70 mm. Hg in 5 to 10 minutes; the rise is a persistent one, the pressure often remaining raised for several hours after the grafted kidney is removed. Control experiments demonstrated that normal kidneys produce no such pressor response when grafted into nephrectomized dogs. It is evident, then, that the ischaemic kidney releases a pressor substance into the circulation. Houssay and his colleagues consider that this is removed largely by the normal kidney. The strongest evidence in support of this hypothesis is that the experiment just described fails when the recipient animal possesses kidneys. Further experiments were made on the distribution and nature of the active substance, using the Laewen-Trendelenburg toad preparation to test diluted plasma for its vasoconstrictor properties. It was found that the blood coming from the ischaemic kidney of dogs with hypertension contains a vasoconstrictor substance; that this substance is present in much smaller concentrations in the blood from other parts of the body; and that it is absent from the

[1] *British Medical Journal*, 1938, **2**, 897.
[2] *J. Physiol.*, 1938, **94**, 281.

blood of the renal vein and other vessels of normal dogs. The active substance does not pass into the ultrafiltrate of plasma, or into the Folin and Wu filtrate. These properties it would share with renin, but there is as yet no further evidence of identity.

DIET IN THE TREATMENT OF CANCER

The old belief that cancer is due to something contained in or missing from the diet survives in various forms. Kretz[1] recently extolled the value of dietetic treatment. He believes that cancer is due to a local stimulus and a general predisposition, and that the general factor can be influenced by diet. Known or imagined metabolic disturbances involving proteins, carbohydrates, fats, and vitamins provide him with a basis for the construction of a "cancer-hostile" diet whose main features are protein in easily assimilable form, vegetable oils in place of animal fats, and a low carbohydrate allowance. Those who eat mainly fish and foods prepared with oil are credited with a lower incidence of cancer than those who indulge in meat and animal fats; authority for this belief is not supplied. The special diet improves the general condition of the patient and alleviates certain ills caused directly or indirectly by the tumour, but no details are given and there is no intimation that the growth of any tumour was influenced for better or for worse. Lauber, Schoeke, and Bersin,[2] whose paper follows that of Kretz, express the opinion that diet does not influence either the growth or recurrence of tumours. They tested the action of water-soluble vitamins on the course of chemically induced tumours in mice; no important effect on the initiation or growth of tumours was registered. The authors conclude that vitamins have no therapeutic value in cancer. The value of medical treatment for incurable cancer is not in dispute; skilful physicians using dietetic and other methods greatly improve the general condition and comfort of many patients. A belief that diet can cure cancer or importantly retard its growth is not well grounded in fact, and is likely to lead to recurring disappointments.

A NEW DEAL FOR NURSES

There is ample evidence of the general concern for the betterment of the nursing services in this country, both in our hospitals and in the home. No one questions the excellent work done by the present generation of nurses, but the fact that there are not enough of them is proof that all is not well. The recent report of the Government committee of inquiry, the evidence given before that committee by the British Medical Association, and the earlier *Lancet* commission, all show the anxiety the present state of affairs is causing, and the efforts that are being made to secure improvement. A book entitled *A New Deal for Nurses*[3] is a voice from a group of nurses who have ideas. It is written by Miss G. B. Carter, who has a wide experience of nursing and nursing organization. After a most interesting historical review there follow some pertinent criticisms of present methods of training. Could anything be more absurd than the manner in which nurses are taught to learn anatomy by rote! The pith of the author's plan of reform is that there should be experimental training schools. The students should reside in the school or college run on the lines of a hostel, or they might live at home. Every effort should be made to bring them into touch with groups of students training for other professions, as one of the aims of the school would be to break down the isolation which has so much retarded growth to maturity in the nursing profession. Students of nursing, freed from the usual obligations of probationers to do the routine work of the hospital, could acquire the basic principles of nursing much more rapidly than they can do now. "The servant-of-the-hospital element" in the probationer's life of to-day prevents accurate observation of the time really necessary for a thorough training, and it is probable that under the present system many nurses never get properly grounded in some elements of their work.

[1] *Münch. med. Wschr.*, 1938, **85**, 1739.
[2] Ibid., 1741.
[3] London: Victor Gollancz. 5s.

ADVISER ON HOSPITAL FINANCE

King Edward's Hospital Fund for London has decided that, in view of the increasing complexity of hospital services and the apparent need for the greatest possible economy in administration, something more is required than the publication of annual statistics of income and expenditure. It has therefore been decided to supplement the provision of statistics by the institution of a service of an advisory character which will, it is hoped, enable individual hospitals more easily to take advantage of the experience of others. The King's Fund has therefore approached Captain J. E. Stone, at present Secretary of the Birmingham Hospitals Centre, and he has accepted an appointment to the staff of the Fund as from June next.

On March 20 Sir Alfred Webb-Johnson, F.R.C.S., delivered the Anne Mackenzie Memorial Oration, which was founded by the late Sir Colin Mackenzie in memory of his mother. The meeting was held at the Australian Institute of Anatomy with the Minister of Health, Senator Foll, in the chair. The subject of the lecture was the progress of preventive medicine.

Professor René Leriche will deliver the Lister Memorial Lecture before the Royal College of Surgeons of England, Lincoln's Inn Fields, W.C., on Wednesday next, April 5, at 5 p.m. The title of the lecture is "The Listerian Idea in the Year 1939."

We regret to announce the death, after a short illness, of Dr. E. P. Cumberbatch, medical officer in charge of the electrical department and lecturer on medical electricity at St. Bartholomew's Hospital.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

SACRO-ILIAC STRAIN

BY

A. LAWRENCE ABEL, M.S., F.R.C.S.

One of the more irritating remarks sometimes made by a patient to his medical adviser is that, in the patient's opinion—" in order properly to understand his condition " —the doctor should have had the disease for which he is treating the patient, or should have had the proposed operation or course of treatment carried out upon himself. If such a state of affairs is indeed a recommendation, then I must lay claim to this added qualification in regard to sacro-iliac strain, because, in spite of two years' treatment, my own crippling agonies gradually became more and more unbearable until, four and a half years ago, I was fortunate enough to come under the care of Dr. Wallace Duncan at the Crile Clinic, Cleveland, Ohio. Since that time I have seen upwards of 300 cases of this distressing complaint in my own practice, and my remarks on this subject are therefore the result of a more than ordinarily personal knowledge of the condition.

Sacro-iliac strain is by far the commonest cause of the complex group of symptoms often called " low back pain." Even taking into account the more accurate diagnosis and treatment of the various causes of low back pain, there seems to be no doubt that sacro-iliac strain—like obliterative arterial diseases and certain forms of cancer—is relatively much more common than it was a decade or two ago. Many unfortunate sufferers are likely to remain unrelieved until the term " rheumatism " is discarded, and until careful investigation, accurate diagnosis, and suitable treatment are applied to every form of low back pain.

Symptoms

The essential feature of the condition is pain. The degree of pain varies in different cases. The milder forms give rise to a discomfort on one side over the affected sacro-iliac joint, which may become worse at certain times. All grades of pain are found up to the most severe agony. Although the pain begins over one sacro-iliac joint it may extend to the opposite side, round the pelvis, and down the whole course of one or even both sciatic nerves. Sitting, standing, or lying may be a persistent torture, diminishing the patient's sleep, undermining his health, and becoming accompanied by a severe neurosis. Three of my patients, at the time when I first saw them, had been confined to bed for as long as six weeks with no relief from various electrotherapeutic and manipulative measures, and their only movements had been to roll out of bed and crawl on all fours to the commode.

The onset of pain may be either sudden or gradual. Even a slight injury, such as a strain at golf or tennis, may bring on acute disabling symptoms. The lifting of a heavy weight, or a sudden strain while bending, is another common causative factor. A unilateral leverage suddenly applied through a lower limb, as in football, skiing, or falling from a horse, also accounts for a certain number. When the onset is gradual it may still have been caused by a sudden injury. By far the largest proportion of patients in whom the onset has been gradual have no recollection of any sudden strain or injury when first questioned. In fact, usually they stoutly deny that any such accident has ever happened to them. By the time of their second consultation they have often remembered a severe fall or strain which has occurred, commonly, in my experience, anything from two to eleven years before they reach the surgeon for advice. In yet other types of cases the cause has obviously been a chronic long-continued strain—for example, pregnancy and occupations involving standing with the weight on one leg. I have seen several dentists and stokers with this condition. Nurses who were in the habit of straining themselves, in a bending position, by lifting heavy patients, have been among my patients.

Characteristics of the Pain

A careful history must be taken in order to elicit exact information as to the site and distribution of the pain. The patient commonly points to the posterior aspect of the sacro-iliac joint or runs his hand across the small of the back opposite the upper half of the sacrum. When the condition is bilateral there is sometimes difficulty in deciding which side is the more painful. The pain is usually increased or induced by forward flexion of the body beyond a certain degree. The moderate degree of bending over a comfortably raised operating table—that is, 10 to 15 degrees—does not induce the pain, but flexion of the trunk to more than this angle—for example, digging, bending over a bed or a bath or a wash-tub—will excite the pain. It is commonly worse at night, as lying in bed tends to obliterate the normal lumbar lordosis and a further strain is put upon the sacro-iliac joint. Similarly, standing or sitting for a long time, or even sitting for a short time on a hard chair, tends to make the pain worse, as in these circumstances the muscles become more readily tired and allow further straining of the joint to take place. Any pelvic abnormality or even a normal menstrual period often increases the pain, as also may a loaded colon and rectum.

As the pain increases in severity so the distribution of the pain increases in area. This is also usually true as the condition becomes more chronic. In all cases it reaches the sciatic notch and the region of the inferior sacro-iliac ligament. In at least nine cases out of ten it radiates to the posterior aspect of the thigh, and in nearly as many to the posterior aspect of the leg, and in a large number as far as the heel. The commonest mistake in diagnosis is to call the condition sciatica, and it must always be remembered that the most frequent cause of sciatica is sacro-iliac strain. As the condition gets worse the pain may spread up the spine, around the iliac crest, and into the lower part of the iliac fossa or groin. The patient often complains that he cannot lie with comfort on the affected side, and turning in bed may bring on excruciating pain in the region of the joint and render sleep fitful and restless. Occasionally pain is complained of inside the pelvis. This is an interesting type of pain: the patient describes it as " un-get-at-able," and says he has a desire to press three or four inches into the pelvis between the rectum and the ischial tuberosity. In the majority of cases the pain is unilateral, and if adequately treated will not spread to the opposite

side. In untreated or improperly treated cases a large proportion find the pain gradually beginning on the hitherto unaffected side, rapidly spreading to the buttock and down the leg, until a severe bilateral sciatica has developed that brings the patient to the surgeon with a suspected carcinoma of the rectum or to the neurologist with a suggestion of a spinal or cauda equina tumour.

Coughing, sneezing, and straining at stool produce varying degrees of pain—often excruciating—and, though this is transient, the patient often seizes a handy object for support, for he has the momentary feeling that the bones of his pelvis are being wrenched apart. In the more severe forms it is fairly common for a patient to take half an hour to get his socks and shoes on. Almost all forms of indoor and outdoor exercises are denied to him. Walking can be indulged in in moderation until a late stage of the disorder, and horse-riding seems to improve rather than to aggravate the condition.

It already follows from what has been said that a most careful physical examination of the patient must be made in all cases, and it is equally important that an *x*-ray examination of the lumbar spine and pelvis should also be made.

Clinical Examination

When the patient is completely undressed he should be asked to stand erect in a good light. The shoulder on the affected side will usually be seen to be anything from half an inch to three inches lower than on the sound or less affected side. On asking him to indicate where his pain is he will point to the posterior superior iliac spine, which overlies the centre of the sacro-iliac joint. Sometimes he indicates both this point and one an inch or two lower, over the great sacro-sciatic notch. The patient should then be told to lie on his face, and the surgeon should press firmly over each spinous process in turn, and over the whole of the sacro-iliac and gluteal regions. The point or points of maximum tenderness are usually elicited on deep pressure over the posterior superior iliac spine and the inferior sacro-iliac ligament and the great sciatic notch. Occasionally tenderness is also present on pressure over the buttock to the outer side of this area. The great sciatic nerve should now be carefully palpated on each side. The place where this is most readily felt is where it crosses the lesser trochanter of the femur. This point may be easily found in the following way: with the patient still lying on his face, the examiner stands on the patient's left and places the thumb of his left hand on the top of the patient's left greater trochanter and his middle finger on the ischial tuberosity; his index finger will fall naturally on to the position of the lesser trochanter of the femur. His right hand should raise the patient's foot until the knee is at a right angle, and the leg should be used to rotate the femur alternately inwards and outwards. His index finger will then easily detect the subcutaneous portion of the great sciatic nerve rolling between it and the trochanter, and thickening or tenderness may be found. The opposite limb should be examined in a corresponding manner.

The patient is now asked to turn on to his back. The more serious the case the more will be the discomfort produced by the turning, and the pain may be still present while the patient is lying quiet. The lumbar spine is often held away from the couch, and any attempt to flatten it either actively or by abdominal pressure elicits or increases the pain. The following investigation is then carried out on each leg alternately: keeping the knee extended, place the hand under the patient's ankle and slowly raise the leg, asking him to indicate when and where he begins to feel pain. Note the angle of flexion of each thigh on the trunk when pain behind the knee or in the hamstrings first occurs. Further flexion is limited by pain, and the degree of movement possible is less than in a normal individual, and usually less on the affected side than on the opposite one. At the same time as the hamstring pain is produced a small proportion of patients experience pain in the sacro-iliac region. Occasionally this pain is felt in the sacro-iliac joint when the leg of the same side is flexed, and any attempt to increase the movement results in an increase of pain in the sacral region or in the leg. This is known as Goldthwaite's sign. To my mind a more pathognomonic sign is when the pain in the affected joint is elicited by flexion of the *opposite* side, but even this occurs in only some 25 per cent. of cases. In my experience pain in the leg is present in the vast majority of cases when carrying out this investigation. The milder the case the nearer does the possible movement approach to the normal, while in the more severe case pain is more quickly produced.

While the patient is still lying on his back a general clinical examination should be made, with special reference to the abdomen. The central nervous system—knee-jerks, ankle-jerks, and pupil reflexes—should be carefully examined. The tendon reflexes on the affected side are often diminished. A rectal examination should be made in all cases, and a vaginal examination in women, as mild degrees of low back pain may be produced by a great variety of both minor and major rectal and gynaecological conditions.

The patient is now asked to stand again, and the movements of his spine are tested. When rising from the recumbent or sitting position the hands are commonly used to help him to get up. On stooping, flexion of the trunk is limited, and whereas a few weeks or months before he could touch his toes with his finger-tips he may not now be able to get within a foot or even two feet of them. When he straightens his back pain is experienced over the affected joint, and on asking him to bend further backward, beyond the vertical movement, is found to be limited; many patients also flex their knees. Rotation of the spine is unaffected. There is often diminution of unilateral side bending, whereas the unaffected side is free. When walking the patient avoids long steps on account of the characteristic spasm of the hamstring muscles and a diminution of the pelvic inclination, which is commonly present. It is often alleged that the pain in cases of sacro-iliac strain may be elicited by lateral compression of the pelvis. This is absolutely incorrect.

X-ray Examination

In a typical case of sacro-iliac strain *x*-ray examination, including stereoscopic pictures, reveals no abnormality whatever. In rare cases a little sclerosis may be detected in the bone immediately adjacent to the joint. In long-standing cases the changes of osteo-arthritis may rarely be seen. The real reason for *x*-raying all cases is to exclude abnormalities of the spinal column and such rarities as tuberculous disease of the sacro-iliac joint and malignant conditions of the bones in the immediate vicinity.

Differential Diagnosis

Apart from the general and intra-abdominal conditions already mentioned as producing low back pain, it is important to be familiar with certain local lesions which

may simulate or be confused with true sacro-iliac strain. These are as follows: lumbo-sacral strain, lumbar back strain, osteo-arthritis of the spine, spondylolisthesis, lumbago, and coccygodynia. In addition to the above there are, of course, more serious conditions with their own typical signs and symptoms, which may produce pain in the lower part of the back. For example, tuberculosis of the spinal column, depression fractures of the lumbar vertebrae, prolapse of the nucleus pulposus of the intervertebral disk, and tumours of the spinal cord and cauda equina. Not only are these conditions of considerable rarity, but they are usually readily distinguished by their physical signs and radiological and other appearances, and they will not be discussed in any more detail. The commoner conditions, however, demand more detailed attention.

Lumbo-sacral Strain.—In this condition the pain is situated at the lumbo-sacral junction, and may be referred down the lateral side of the leg and on to the dorsum of the foot. Examination reveals that the tenderness is situated over the spines of the fourth and fifth lumbar and the first sacral vertebrae and over the ilio-lumbar ligament. It is found that the movements of the lumbar spine are restricted in all directions, whether the patient is standing, sitting, or lying, whereas in sacro-iliac disease the movements are all free, except unilateral side-bending and forward bending in extremes with the knees straight. On the other hand it is found that in cases of lumbo-sacral strain the patients can bend forward freely, sitting or standing, because they hold their spine rigid and movements take place at the hip-joints. On carrying out the straight-leg-raising test with the patient lying in the supine position it is found that in lumbo-sacral strain the movement of the leg is limited in extremes on both sides equally, whereas in sacro-iliac disease there is unilateral limitation at a small range on the affected side. It is also important to note that extension of the thigh causes as much pain as flexion in lumbo-sacral strain, whereas this is not the case in sacro-iliac strain. Further, in lumbo-sacral strain the referred pain passes to both the lower limbs and not only to the affected side as in sacro-iliac strain. It is, of course, important to remember that sacro-iliac strain may be bilateral. In lumbo-sacral strain there is no deformity and the radiographs are normal.

Lumbar Back Strain.—This condition, which may be acute or chronic, is a localized rupture of the deeper fibres of the erector spinae muscle of one side, produced by muscular action. On examination pronounced muscular spasm of the erector spinae is observed in the lumbar region. There is a definite localized point of tenderness of the erector spinae of one side, and in acute cases the whole of the lower part of the back is found to be hyperaesthetic. Radiographic appearances are normal, except in rare cases where there is a fracture of a transverse process.

Osteo-arthritis of the Spine.—In this condition the pain and tenderness are situated over the lumbar spine and frequently extend upwards into the dorsal region. The movements of the lumbar spine are stiff and limited, and *x*-ray examination shows the typical appearances.

Spondylolisthesis.—In this complaint there is almost always a congenital non-fusion of the elements of the neural arch of the fifth lumbar vertebra, with a consequent tendency of the body of that vertebra to slip from the upper aspect of the sacrum. Actual deformity of the spine immediately above the spinous process of the fifth lumbar vertebra may be present. Localized pain and tenderness are bilateral. None of the typical signs of sacro-iliac strain is present, and radiographs clinch the diagnosis.

Lumbago.—In this condition the pain is much higher than in sacro-iliac disease; it is stabbing in nature and affects the lumbar muscles on both sides. Goldthwaite's sign is absent.

Coccygodynia.—The pain in cases of coccygodynia is situated at or around the region of the coccyx and at a lower level and nearer the midline than the pain of sacro-iliac strain. The two conditions are, however, occasionally confused. Coccygodynia is of two types: (1) traumatic; (2) functional or hysterical. Traumatic coccygodynia is produced by falls, kicks, etc., and the coccyx may be fractured or displaced forwards or laterally. It produces pain on walking, sitting, and defaecation. The displacement may be reduced by a finger passed into the rectum aided by the thumb on the skin outside. Such replacement is seldom maintained, but strapping with a firm pad is usually sufficient to effect a cure, even though the displacement remains. The immediate pain of the injury may be relieved by the injection of from 10 to 20 c.cm. of an oil-soluble anaesthetic. In cases of functional or hysterical coccygodynia there may be a history of some minor injury or of no injury at all. The pain is described as being excruciating and it is, indeed, out of all proportion to the physical signs. The condition is most intractable to treatment, as removal of the coccyx is followed by cure in only some 50 per cent. of cases. In this type of case psychological treatment is indicated before recourse is had to surgery.

Treatment of Sacro-iliac Strain

Radical treatment for the cure of sacro-iliac strain may be carried out in almost all cases without resort to surgical operation. Most cases respond to treatment by manipulation or fixation with a belt, or, better still, by a combination of the two. In comparatively mild and early cases manipulation may sometimes be carried out with the patient conscious, but not, of course, in powerful muscular people. With a rather more long-standing case of moderate severity the manipulation should be performed under intravenous pentothal anaesthesia, which produces full muscular relaxation lasting for the two or three minutes necessary for the performance of the manipulation and allows the patient to go home a few hours later. The actual manipulation employed is a forcible twist of the pelvis upon the spine.

Manipulative Technique

The patient lies upon a firm low operating table or couch, and as soon as he is fully anaesthetized rotatory manipulation of the pelvis of the affected side and of the opposite side is carried out and forced flexion and extension of the lumbar spine performed. The patient lies upon his back and the surgeon raises the leg of the affected side and passes it across the opposite limb in such a way as to cause the pelvis to rotate away from him, and until the leg and foot hang over the table on the opposite side. His other hand steadies the patient's shoulder on the affected side and keeps it so far as possible resting on the table throughout the manipulation—that is to say, the supine position is maintained on the shoulder girdle as far as possible and the prone position as far as may be adopted for the pelvis. Firm pressure is then put upon the posterior aspect of the crest of the ilium and a sudden wrenching movement is made to try and turn the innominate bone of the affected side forwards away from the surgeon towards the

table, all the time keeping the shoulder of the affected side as much in the supine position as is possible. In a large proportion of cases a crack or crunching noise is clearly audible; this, however, is not essential, and many cases obtain dramatic relief when no sound has been produced.

The patient's pelvis is now rotated in the opposite direction, and with the surgeon standing on the other side of the table a similar forcible movement is carried out upon the innominate bone on the less affected or unaffected side. Several forceful jerks are made upon the iliac crest so as to be certain that the sacro-iliac joint is fully mobilized. The patient is then placed in the supine position and the thighs and knees are forcibly flexed upon the trunk, so that the fullest possible flexion of the whole spine is obtained. Lastly, the patient is placed in the prone position and, with one arm of the manipulator resting beneath the patient's knees and the other in the small of his back, the spine is forcibly extended as much as possible.

Fixation with a Belt

It has been learned from experience that manipulation of the more severe grades of the condition may cause an acute exacerbation of the pain, with consequent increase of the disability. These cases are best treated, therefore, with a sacro-iliac belt. In my experience there is only one type of sacro-iliac belt which is really efficient, and that is the Camp sacro-iliac support. This is made in Canada and is readily available in this country. I find, however, that it is so poorly known and its benefits so little recognized that a few words as to its efficacy will not be out of place. There are three different types of sacro-iliac support made by Camp's, of which their third type (Series C) is by far the most efficacious. This belt, when it is completely relaxed, should be small enough to encircle the pelvis firmly. It suits any average build of patient and comes well down under the gluteal muscles at the back. It has two powerful straps, pulling upon which causes great pressure around the pelvis. A sense of comfort and relief from pain are immediately experienced when the belt is accurately applied. In even the most serious cases the patients are usually back at work within twenty-four hours of its application. The belt is applied around the pelvis while its straps are completely slackened, and it must always be kept well down in position by perineal straps in the male or by attachments to the stockings in the female; many of the latter, however, prefer perineal straps on account of the injury to their stockings. When correctly in position the middle of the belt should be opposite the anterior superior iliac spines in front. Then the two lateral straps must be drawn equally tight, and as tightly as the patient can comfortably stand. When the belt has been fastened the patient should just be able to sit down on an ordinary chair without cutting the front of the thigh where it joins the groin. The pressure points where cutting tends to occur are at this position on both sides and in the midline in front, where the belt stops at about the level of the umbilicus. In these situations a little padding with a small square of gamgee tissue or a silk handkerchief will prevent actual damage to the skin. The patient or the surgeon may know when the belt is correctly adjusted by the fact that the opening in the back of the belt where the lacing is situated should have its two sides parallel.

The belt should be worn continuously by day for a week or ten days, in severe cases without other treatment, or in milder cases after manipulation has been carried out. If at the end of this period there is not a very great improvement in the patient's condition, then manipulation should be undertaken. If manipulation has been previously undergone without an anaesthetic, then on this occasion the patient should be given a general anaesthetic. If improvement is considerable there may never be any need to manipulate the case, or a further manipulation in the consulting-room without anaesthesia may be enough. As a rule it is necessary to wear the belt for about four weeks, leaving it off at night time and when exercises or radiant heat are employed.

My common practice, therefore, is as follows: When the patient is seen at the first consultation and a diagnosis of sacro-iliac strain is arrived at arrangements are made for a radiological examination and for the patient to be fitted with a Camp sacro-iliac belt. Two or three days later, at the second consultation, the radiographs are examined and the belt personally fitted to the patient. In early non-muscular cases manipulation is given in the consulting-room and the belt fitted immediately. Seven to fourteen days later the patient reports progress; in the vast majority of cases no further manipulation is necessary and the patient is advised to wear the belt for a further week or two. The belt may then be gradually left off and more strenuous exercises undertaken. It is uncommon for a patient to need to wear the support for more than three or four weeks, but if symptoms persist after one or two conscious manipulations recourse should be had immediately to manipulation under anaesthesia and the belt should be resumed for a short time. As the belt is discarded, so more and more carefully graduated exercises to move the spine and joints are encouraged.

Little has been said of electrotherapeutic measures in relation to this type of strain. In my experience their influence is of very little value, though in the more severe types radiant heat, medical diathermy, and infra-red irradiation have sometimes played an alleviating part. Radical surgical operation is indicated only in those cases which are resistant to the two foregoing methods, and so far I have never had to resort to it. Various types of operation are employed, the essential feature of each being the same—namely, to cause complete bony ankylosis of the two sacro-iliac joints.

With a more careful investigation and more accurate diagnosis of the condition a great deal of unnecessary suffering can be avoided and the condition be cured in a relatively short time. To epitomize the treatment there should be:

1. Prompt application of mobilization in early and mild cases by manipulation.
2. Complete and thorough fixation with the Camp sacro-iliac belt, alone or following manipulation in the more serious cases.

A course of lectures on cranial radiology will be delivered in the Institute for Tropical Diseases, Antwerp, on Thursday, July 27, and the two following days, dealing at length with the technique, the interpretation of films, and the management of a radiological clinic. There will be simultaneously an exhibition of films. On the fourth day, July 30, there will be a general meeting of all radiologists and clinicians interested in cranial radiography, with a view to founding an international society in this application of radiology. The fee for the course of lectures is 300 Belgian francs, and fuller details of the proposed arrangements may be obtained from Dr. R. Thienpont, Avenue Rubens 30, Antwerp. The course will include such topics as radiography in relation to the influence of sinus infection on the brain; fractures of the labyrinth; mastoiditis and chronic otorrhoea; and the eye.

Reports of Societies

MISLEADING LEADING SYMPTOMS

At a meeting of the Hunterian Society on March 20, with Mr. A. C. MCALLISTER in the chair, a discussion took place on "Misleading Leading Symptoms."

Lord HORDER said that they all, if they looked back over a number of cases, would be aware of occasions when they had taken the presenting symptom and allowed it to mislead them. Pain—or feigned pain—was the basis of most of such instances. A symptom might be local but the disease producing it general. He instanced a neuralgia, a focal pain, which sometimes occurred in the first days of typhoid fever, and which might be severe and local enough to suggest an acute sinusitis. In poliomyelitis retention of urine might be the presenting symptom which was apt to mislead. Again, on the onset of pneumonia, especially in elderly people, while the temperature might be equivocal, a picture of cardiac shock might be presented. It was not until one had treated them on that basis and warmed them up a little that one found oneself faced with pneumonia or acute pyelitis or some acute sepsis. The onset of a cerebral tumour might be marked by a psychosis, often of a somewhat systematized type. Pain might be referred to one part of the body when the disease causing it was in another. He instanced the confusion which sometimes arose as between gall-bladder disease and angina. Sometimes the patient had both conditions, so that only the elect could decide which was the one troubling him at a given moment. Anginal symptoms were sometimes indicative of diaphragmatic pleurisy, and the acromial pain so common in pleurisy, whether diaphragmatic or not, might mislead. The spread of anginal pain was easy to follow, but when the pain missed a part of its spread and occurred only at the wrist or elbow, the patient's description was sometimes misleading. Diverticulitis was responsible for a whole gamut of misleading leading symptoms. He instanced a case in which the abdomen was opened for obstructive symptoms, when there proved to be no intestinal obstruction but a pelvic thrombosis. Pain was sometimes contralateral. In duodenal ulcer, where the patient had all the classical symptoms and the diagnosis was confirmed by radiology, and perhaps also by surgery, both the pain and tenderness might be left-sided. Quite a number of functional diseases simulated organic trouble. He mentioned, in particular, migraine. Sometimes, again, when there was strabismus and diplopia there was a disposition to infer serious organic trouble, although the whole condition was really a sign of excessive fatigue. He recalled a case of intense headache, even to the point of a little mental confusion on account of the pain, with stiffness of the neck and slight pyrexia—a picture, in other words, suggesting a mild meningitis—which was due only to the strain of a long motor drive in fog.

Briefly touching on some other conditions, Lord Horder suggested that a number of epileptics "got away with it" in the consulting-room by emphasizing the "aura." "If only you could cure this flatulence, doctor, I would not have these nerve storms." Anginal patients said the same thing: "As soon as I get rid of the wind the pain goes." As for haematuria—a sign, of course, rather than a symptom—in these days of cystoscopy it was worth remembering that there were haematurias which did not connote stone or neoplasm or any local renal lesion. There was the chronic interstitial patient with his hyperpiesis, and the patient getting on in years who had taken his hexamine rather longer perhaps than was advisable and sometimes got haematuria. It was rather surprising that haematuria was not even now recognized as being common and even considerable in some cases of acute pyelitis. Anuria, when the patient had vomiting and perhaps also diarrhoea, sometimes misled badly. Dyspnoea was not always cardiac in spite of the French physician's dictum, "In shortness of breath, examine the heart and not the lungs." It was sometimes due to emphysema with little or no cardiac dilatation. Finally Lord Horder referred to the enlargement of organs without any other signs of disease. He instanced also a pronounced case of nephroptosis in which the lump simulated a colon neoplasm.

The Leading Symptom of Pain

Mr. W. H. OGILVIE said that he felt with Lord Horder that it was with pain they must chiefly concern themselves, because pain was the symptom which above all others brought patients to see them, and pain was something that could not be analysed. If one considered the mechanism of pain, the travel of a sensation to the cerebral cortex, the "ping-pong" movement round the association centres, until it finally "rang the bell and produced the diagnosis," it was obvious what opportunities for error there were, just as there were between the sound of the trumpet at the Queen's Hall and the hoot that emerged from the wireless set. The nature of pain depended on the age, sex, upbringing, courage, and general background of the patient who experienced it. An ache to one man was an agony to another. The severity of any pain was one of the greatest sources of error in surgery. He himself ranked pains in the following order of severity: perforated duodenal ulcer, gall-stone colic, renal colic, pancreatitis, appendicitis, and intestinal colic. But all these things were simply graven on the memory by experience and could not be taught. Not only the severity of the pain but the make-up of the sufferer had to be taken into account. The phlegmatic or the courageous person would not be disturbed by severe pain, whereas the highly strung or cowardly would be completely overthrown by it. The dishonest patient might invent it and by practice and study produce a story to deceive the most expert. Here Mr. Ogilvie mentioned a seaman whom he called a "professional perforator." He could describe the agony of perforation with such wealth of detail, he could look so ill and hold his muscles so rigidly that he had been operated on fourteen times in various hospitals in different parts of the world. Although he spent by far the greater part of his life on board ship, he had never perforated on board, or in a small port which had no hospital!

Mr. Ogilvie confessed that he feared that the highly specialized education to-day was not making mistakes less frequent. A man who had learned by long apprenticeship the general signs and symptoms of disease and the reactions of people to them was far less likely to be misled than the man who had been brought up to study just one particular branch of medicine, and knew all about one organ and one disease, and could detect the earliest manifestation of such disease, but was able to swallow at the same time a whole "camel" of coincident general disturbances inside the patient. "The trouble is that sick people to-day are drafted straight off to the specialist, so that the poor girl who has a 'Burne-Jones neck' is very lucky if she escapes total thyroidectomy, while her sister who has got a pain in the back is given no time to make it up with her boy friend, who is the real cause of her pain, before she is sent to Harley Street, and it depends very much which door-bell she rings what she has done to her." Vomiting, distension, and constipation in an old man nearly always meant carcinoma of the colon, yet almost the identical picture was to be seen occurring in uraemia. Haematemesis might be an indication of early organic disease, but the vomiting of large quantities of blood might be a symptom of some hysterics or malingerers. He mentioned a woman who several times vomited a chamberful of blood, but never showed any radiological deformity or alteration in the blood picture, and the bleeding ceased suddenly when her husband was

killed in an aeroplane crash. As a final instance of being misled, he mentioned a woman patient who was sent to him by a Service colleague over-seas. She was wasted to a skeleton and deeply pigmented, and she had a large and hard liver. On surgical exploration he found to his delight that instead of the cancer he had feared there was only a large oval stone in the common duct. This he removed and she made excellent progress. But he was disappointed to find that she did not recover her normal colour, and it was four weeks before he realized that this remaining pigmentation was racial and not icteric.

Neurological Aspects

Dr. F. M. R. WALSHE said that of neurological out-patients he supposed nearly 50 per cent. complained of headache, but in ten such successive patients there might be no physical factor in common. There was the paroxysmal headache and the continuous headache. There was the rosy, plump young woman, with an animated and cheerful manner, who came to the out-patient department and said with a smile that she had suffered intolerably from intense headaches for five, ten, fifteen, or twenty years. The word "headache" was obviously an improper one to use. God had never made a headache which lasted five, ten, fifteen, or twenty years. One was really listening to a figure of speech. It was another way of describing a number of symptoms—symptoms capable of varying interpretations. One swallow did not make a summer, nor one symptom a clinical picture. If an endeavour were made to observe the whole constellation of symptoms the liability to error would be less.

Dr. GEORGE RIDDOCH remarked that pain was a symptom frequently absent from neurological cases. In the development of serious disease of the brain, headache might be a late symptom. All cases of G.P.I. did not show the same symptom picture, and sometimes the truth was ascertained only on inquiry among the relatives as to a recent change in the individual's character.

Mr. L. E. C. NORBURY, Dr. HOWARD HUMPHRIS, Dr. ALASTAIR MACGREGOR, and Mr. H. L. ATTWATER related cases in their experience in which symptoms had almost misled. Mr. C. P. G. WAKELEY mentioned that it was quite common to see patients who had the symptoms and signs of appendicitis or of bladder trouble but who declared that they could not have either of those conditions because they had been *x*-rayed and found normal. On several occasions he had removed septic gall-bladders from patients who had been declared normal radiographically. Mr. W. D. DOHERTY said that there was a tendency to send patients to the specialist because their leading symptom was that which characterized the cases with which the specialist was most concerned. A patient with frequency of micturition, for example, would be sent to the urologist when quite possibly the condition had nothing to do with the genito-urinary system. Mr. MORTIMER WOOLF deprecated the diversion of the discussion to the consideration of frauds. Frauds in medicine could deceive anybody, but he did not call frauds leading symptoms. What was sometimes much more difficult was the semi-fraud. In framing the discussion it had been intended to elicit those difficult cases in which a common symptom appeared that had not the bearing one would expect. He gave an example of haematuria in children. How many people knew that peardrops, owing to the acid anilides of which they were made, would produce haematuria? Another symptom of a genito-urinary nature which was misleading was epididymo-orchitis coming on as the first manifestation of enlarged prostate.

Mr. DICKSON WRIGHT said that of all the mistakes they might make the most serious was to have regarded as a fraud a patient who was not. When a patient got branded as a neurotic and went from one consultant to another, each of whom knew her story and discounted her case, and eventually was found to be suffering from some malignant trouble, it was no credit to medicine. He mentioned a case which was thought to be pseudocyesis and turned out to be malignant ovarian tumour and ascites. He mentioned also a woman who had had four fingers opened for whitlows, yet all the time was suffering from Raynaud's disease. Dr. W. H. F. OXLEY proposed a vote of thanks to the openers of the discussion, and Dr. D. C. NORRIS, in seconding, mentioned the case of a man who was brought into hospital, having been found unconscious in the middle of the road. There was a large effusion of blood in the loin, also haematuria, and he was taken to the operating theatre as a case of ruptured kidney. The surgeon, however, before proceeding to the operation, noticed some nodules on the patient's forehead, and said, "This is not a case of ruptured kidney, nor a surgical case at all. It is haemorrhagic small-pox." And he was right.

CHEMOTHERAPY IN COMBINATION WITH IMMUNOTHERAPY

At a meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine on March 17 Professor ALEXANDER FLEMING of the inoculation department, St. Mary's Hospital, made a communication on the synergic action of vaccine and serum therapy and treatment with sulphanilamide and M & B 693.

Professor Fleming said that it had been already shown that these new chemotherapeutic agents had rather a bacteriostatic than a bactericidal action. The chief result of the drugs was some interference with the growth of organisms, and the actual destruction of the invaders was completed by the natural defensive mechanism of the body. The more effective that mechanism—or, in other words, the higher the degree of immunity—the better would be the result of the treatment. Even with the organism most sensitive to the drugs—namely, the haemolytic streptococcus—the drug alone did not suffice to destroy the organism. Immunity could be increased passively by serum therapy or actively by vaccine therapy. The results of combined serum therapy and 693 were not yet available, but he had carried out some experiments *in vitro* which showed the benefit of the combined administration. The anti-pneumococcic serum was found greatly to enhance the anti-bacterial effect of a blood–693 mixture on pneumococci. Indeed, it was quite a convincing demonstration of the benefit of combining these two anti-bacterial substances. Several workers had shown that antiserums used in conjunction with sulphanilamide had a very striking action. With regard to active immunity or vaccine therapy, the administration of vaccines in association with the new chemotherapeutic agents had been proved to give results far superior to either method of treatment alone. Professor Fleming described experiments in the mouse and the rabbit whereby the animals were injected with pneumococcal vaccine and after six days injected with pneumococci. The vaccine therapy alone, like the chemotherapeutic agent alone, resulted in a diminution in the number of colonies, but only the two combined resulted in a total destruction.

From various quarters, and most recently from South Africa, there had come confirmation clinically of these results in pneumococcal and other infections. The clinical evidence was not conclusive, but it all pointed in the same direction—that by active immunity with vaccines the result with 693 or sulphanilamide was reinforced. His conclusion to the whole matter was that the new drugs acted on certain sensitive bacteria in such a way that the reproduction of the bacteria was retarded or abolished, and when this happened the natural defensive mechanism of the body completed the task of destruction. The result in any particular case thus depended on the natural sensitiveness of the infecting organisms to the drug and also on the immunity of the patient. The immunity could be increased by serums or vaccines, but, of course, serums were available only for certain infections, while vaccines could now be obtained for practically all acute bacterial infections.

Professor F. J. BROWNE asked whether in order to produce active immunity in a patient it was necessary to give the vaccine before the illness. He had always supposed that during an acute illness such as a streptococcal septicaemia the patient was being vaccinated sufficiently, and that it would not help matters to give a vaccine of the same organism. Mr. ALECK BOURNE, from the chair, said that he could not help feeling a little uncertainty about the giving of serum. He had always understood that anti-streptococcal serum was one of the best of culture mediums, and it surprised him to hear that this serum could really be efficient in assisting the action of the drugs sulphanilamide and 693. He also wondered, with Professor Browne, for what purpose vaccine was given to a patient already heavily infected with the streptococcus or the pneumococcus.

Professor FLEMING said that serum, like 693 or sulphanilamide, did not kill; it damaged the bacteria, and it was the leucocytes in the body which actually killed the organism. Anti-streptococcal serum was perhaps not as efficient as anti-pneumococcal. As to the use of vaccine after an infection had started, the arguments on this point had lasted a considerable time. Almroth Wright believed that persons could be usefully inoculated after they had got the disease, and he thought he had established that principle. He instanced a case of recurring boils; the patient was continually being vaccinated by his own staphylococcus, but had not been able to immunize himself; a vaccine administered from outside had proved effective. Some American work had shown a successful result in pneumonia by vaccinating the patient with a different strain of the pneumococcus. How far this applied in puerperal infections he did not know. As to the choice between 693 and sulphanilamide, the former was far more potent, but he would say nothing of respective toxicity.

Injection of Pituitary Extract after Delivery

Dr. D. WILLIAMS, Mr. R. C. PERCIVAL, and Mr. S. G. CLAYTON presented a short communication on the injection of pituitary extract immediately after delivery and before the third stage of labour. Fifty normal primiparae were taken, with fifty similar cases as controls, and a 5-unit dose of pituitrin posterior lobe extract given intramuscularly directly after the birth of the child. The average duration of the third stage of labour among the treated women was 8.3 minutes, and among the controls 13.5 minutes. Five of the treated cases and two of the controls showed post-partum haemorrhage. The average loss in the third stage of labour, including the cases of post-partum haemorrhage, was 8.7 oz. in the treated cases and 8.3 oz. in the controls; and excluding the cases of post-partum haemorrhage it was 5.5 oz. in the treated cases and 7.5 oz. in the controls. There appeared to be no definite advantage in the giving of pituitrin and there was an increase in the incidence of post-partum haemorrhage, but the series was small.

Elimination of Breech Presentation from Private Practice

Dr. G. F. ABERCROMBIE, in a short communication on this subject, said that a breech presentation was found soon after the twenty-fifth week in more than 20 per cent. of pregnancies in private practice, and was often the cause of unpleasant symptoms. It was very seldom complicated by any other obstetric abnormality. In patients who bore relatively large children and whose muscles had not been stretched by frequent pregnancies, spontaneous version to vertex might be confidently awaited up to, but not beyond, the thirty-second week. External version at this time hardly ever failed and was apparently free from risk; anaesthesia was not required and relapse was uncommon, though constant vigilance was necessary. Later in pregnancy the difficulties of version were increased. Labour after version, spontaneous or otherwise, was normal. It was suggested that all breech presentations should, if possible, be eliminated about the thirty-second week, so that symptoms might be relieved, the risk of premature labour lessened, the head fitted into the brim, foetal mortality diminished, and the number of Caesarean sections performed on primigravidae reduced.

At the tenth general meeting of the Midland Mental Pathological Society, held in the New Medical School, Birmingham University, with the president, Sir Gilbert Barling, in the chair, Dr. E. G. T. Liddell of Oxford gave a lecture on "The Integration of Muscle Posture." He described, with the aid of lantern slides and graphs, the paths taken by tendon and sensory impulses at the various levels of the central nervous system, and the effect upon the plastic tone of the muscles. During the discussion which followed, the relations of his findings to clinical cases of post-encephalitis and Parkinsonism and to various clinical phenomena were the subjects of many questions, to which Dr. Liddell replied.

Local News

ENGLAND AND WALES

Emergency Hospitals Scheme for London: Group Officers

The list of group officers included in the information from the Ministry of Health on the emergency hospitals scheme for London published in the *Journal* of March 25 (p. 634) was inaccurately set out. The following is a correct list:

Sectors I and II: Mr. Russell Howard (London Hospital); *Sector III:* Sir Girling Ball (St. Bartholomew's Hospital), Mr. C. A. Joll (Royal Free); *Sector IV:* Mr. Norman Lake (Charing Cross), Dr. Wilfred Pearson (University College); *Sector V:* Dr. H. E. A. Boldero (Middlesex); *Sector VI:* Sir Charles Wilson (St. Mary's); *Sector VII:* Mr. E. Rock Carling (Westminster), Mr. C. H. S. Frankau (St. George's); *Sector VIII:* Mr. C. Max Page (St. Thomas's); *Sector IX:* Mr. John B. Hunter (King's); *Sector X:* Professor T. B. Johnston (Guy's)

The Society of Radiographers

The eighteenth annual dinner of the Society of Radiographers was held in London on March 25 under the chairmanship of its president, Dr. G. W. C. Kaye, F.R.S. The president welcomed a number of guests, including Dr. T. Carnwath of the Ministry of Health, Mr. W. E. Schall, president of the British Institute of Radiology, Dr. Angus Macrae, assistant secretary of the British Medical Association, Dr. H. W. Bruce, principal medical officer of the General Hospitals Division of the L.C.C., Mr. E. L. G. McManus, registrar of the National Register of Medical Auxiliaries, and representatives of the Manchester, Liverpool, and Midland Radiographic Societies, the Scottish Radiographic Society, eastern and western sections, and the Scottish and South-West England branches of the Society of Radiographers. Dr. Carnwath, in proposing the health of the hosts, said that he was glad of the opportunity of meeting his colleagues in one of the ancillary professions who were doing work of ever-increasing importance. Not very long ago medicine was more an art than a science, and manners were probably esteemed more than methods. Those days were gone, and medicine had now extended its frontiers until it had established contact with practically every important branch of knowledge, including not only physics and chemistry but even mathematics. It was recognized that almost every science had something to contribute to medicine, and that the best way to obtain that contribution was to allow those who could make it to carry on in their own way, while ensuring that in the final synthesis each contribution had its proper place. The effect of the forthcoming legislation with regard to cancer might well furnish new opportunities to this branch of

medical auxiliary service. Mr. W. E. Schall paid a special tribute to the president of the society, Dr. Kaye, who had worked for nearly thirty years in the interests of radiology and the improvement of its status. He had been president of the old Röntgen Society and of the British Institute of Radiology, in the creation of which he had taken a leading part. He congratulated him on his recent election to the Fellowship of the Royal Society. Dr. Kaye, in response, mentioned that the membership of the Society of Radiographers now stood at 1,193, and its diploma was accepted everywhere as a sign of merit. During the year new articles of association had been drafted, whereby the council sought powers to take out on behalf of the members policies of insurance against third party risks encountered in the exercise of their profession. The work of members was likely to be extended when the Cancer Bill became law, but they would never forget that the first duty of the radiographer was loyal and efficient service to the radiologist.

Notification of Puerperal Pyrexia

The ambiguous term "puerperal fever" having now been discarded, the Minister of Health has issued new regulations applicable to England and Wales excluding London, which rescind the Regulations of 1926, excepting for London. These "Puerperal Pyrexia Regulations (1939)" come into force on April 1, and are intended to secure adequate treatment in the early stages of puerperal infection. The duties of local authorities are unchanged, but the obligation of notification rests in the first place on the medical practitioner in attendance on the case. The expression "puerperal pyrexia" is defined as meaning "any febrile condition occurring in a woman within twenty-one days after childbirth or miscarriage in which a temperature of 100.4° F. (38° C.) or more has been reached during a period of twenty-four hours, or has recurred during that period." Unless the notifying medical practitioner holds a commission in His Majesty's Forces the local authority shall pay to him for the certificate a fee of one shilling, whether the case occurs in his private practice or not. Upon the receipt of such a certificate under Section 144 of the Public Health Act (1936) the medical officer of health must, within twenty-four hours, forward a copy of it to the county medical officer of health. All the facilities for swift bacteriological diagnosis are thus made available, and the investigation of individual cases can be followed by intensive study of the causation and course of outbreaks of infection in domiciliary or institutional practice. The welfare authorities are notified of cases for which adequate treatment cannot be provided by the patient's unaided resources. The newer methods of treatment include chemotherapy, which is of particular advantage when the correct typing of the infecting streptococci has been effected, if necessary by the pathological laboratories of the Ministry of Health. It should be remembered that welfare authorities are empowered to provide for the special treatment of women suffering from puerperal pyrexia, for consultation with obstetrical specialists, for skilled nursing, and for institutional treatment.

Improved Dietary in Casual Wards

An Order issued by the Ministry of Health will have the effect of improving the diet prescribed in casual wards under the previous Order issued in 1931. Hitherto a special dietary has been prescribed for casual wards, even for those attached to resident public assistance institutions. The new Order will make it possible in cases where the casual ward is part of a public assistance institution for those in the casual ward to receive the same midday meal as the resident inmates of the institution, provided the institution meal contains meat or fish. This change, desirable on grounds of efficiency, will also enable those in casual wards to benefit by the great improvements in institution dietaries brought about in recent years. The opportunity has, at the same time, been taken to make the casual ward dietary more palatable and less monotonous. A pint of tea is to be given with dinner; jam, marmalade, or treacle is to be provided at supper; and the midday meal which is handed to the wayfarer on his discharge from the casual ward is, for persons aged 12 years and upwards, to contain meat as well as the bread and cheese previously prescribed. The meal handed on discharge to children from 8 to 12 years of age is to contain cheese as well as bread-and-butter.

IRELAND

MENTAL TREATMENT IN EIRE

At the last meeting of the Section of Medicine of the Royal Academy of Medicine in Ireland Dr. Francis Pilkington, in a paper on "Facilities for Mental Treatment, Past and Present," traced the development of the facilities for the treatment of mental illness in Ireland down to the present century. St. Patrick's Hospital in Dublin, founded by Dean Swift in 1745, was the first modern Irish mental hospital, and was followed by great building activity all over the country during the next 150 years. Accommodation, however, always lagged behind the need, and large numbers of the insane had to be cared for in the workhouses, where conditions were often very bad. Dr. Pilkington then turned to the developments in the present century, emphasizing especially the changes in the law in many countries whereby patients could enter hospital for treatment on a voluntary basis, and the growth of psychiatric clinics as the centres for treatment of early cases and for teaching and research. The different types of clinics were discussed in some detail, examples being taken from European and American cities, and the question of administration and organization was also considered.

Legislative and Other Shortcomings

Dr. J. Dunne said that the real object of this discussion was to try to focus the interest of the medical profession on the treatment of mental disease. There was very little use in Eire trying to compete with other countries such as England, America, and Holland if one could not obtain in Eire the facilities available in those countries for treating mental patients. An attempt to introduce legislation to allow mental patients to be treated on a voluntary basis had met with no success. Since 1898 legislation in Eire had not kept in line with legislation elsewhere. Grangegorman Hospital Committee was waiting for the sanction of rules for the admission of voluntary patients. This was a very necessary thing. Every day he received applications for the admission of patients for treatment without certification. In the hospital there were 4,000 mental patients and a staff of 800; yet in an institution of this size there had not been a pathological department until six months ago, when a pathologist was appointed, even though the appointment had not been sanctioned by the Local Government Department. Eire was very far behind in legislation which was absolutely necessary in order to have the requisite facilities for the treatment of mental patients. One of the greatest anomalies in connexion with mental hospitals was that they contained patients suffering from every class of mental disease and patients of every age. Those suffering from the acute toxic form of mental disease, epileptics sane and insane, and chronic hopelessly insane people were all in the same institution. In such circumstances treatment was very difficult. Dr. Dunne referred to the need for the establishment of child guidance clinics in Eire; at present there was no method of providing for the backward child, the "problem" child, or the "psychotic" child. Doctors were apt to look on mental disease through the eyes of the laity, and to regard it as an affliction beyond remedy. The malarial treatment of G.P.I. was one of the greatest advances in medicine. G.P.I. had been a hopeless and an intangible disease; now this treatment not only stopped the progress of the disease but cured about 30 per cent. of patients. Involutionary cases of mental disease had in recent years responded in a very

remarkable way to treatment by the various endocrine preparations. The so-called "shock" treatment had also produced the most remarkable results. In Dublin there was now in being an After-care Committee, composed of voluntary workers who did a great deal of valuable work. Dr. Dunne added that he was responsible for the teaching of mental diseases in the three medical schools in Dublin. He was of opinion that it was no use showing students advanced mental patients who were interesting because they were funny or unusual. More attention should be given to mental disease in the curriculum. In Grangegorman Hospital bedside clinics were now held twice a week on all recently admitted cases, as well as the usual lectures. Psychologists now recognized that there was no line of demarcation between the neuroses and the psychoses, but all were part of the same illness, in a different degree. A psychiatrist was merely a doctor who was specially concerned with the psychological side of the question; really the least important side, the important side being the physiological. Psychiatry for children was even more important than for adults.

Urgent Needs of To-day

Dr. H. Lee Parker said that the essential difficulty in Eire was the lack of method for taking care of psychoneurotic and border-line mental cases. In a properly constituted system the first place to which the patient should go would be the general hospital. There he could be examined very carefully from the physical standpoint, and only when no evidence of physical disease was discovered and when the patient was found to be suffering from a nervous disorder, a suitable place for reference should be established. This should be under control of a State mental hospital and carried on by the State. Nevertheless, because of the extreme prejudice in that country against mental disease, such a clinic should be, geographically at least, separate from the main buildings of a mental hospital. It should have an appropriate name conveying no idea of mental disease—for example, "clinic for nervous disorders." In this institution examination and treatment could be carried out, and should the patient turn out to be certifiable he or she could then be disposed of further along to the mental hospital. All patients should be distinctly voluntary and referred there by the examining physicians in the general hospitals. If possible a few beds should be supplied for cases that required more intensive treatment. Since there was no distinct dividing line between sanity and insanity, scientifically speaking, an institute of the type mentioned would be a much-needed and valuable transitional stage in the care of patients who were nervously unfit but not certifiable. It was a crime that in mental hospitals and under one roof there were housed the insane, the epileptic, and the feeble-minded. These should be segregated, and he was looking forward to the time when Eire would have epileptic colonies and schools for feeble-minded. Dr. W. R. F. Collis suggested that children who required psychological treatment might be divided into four classes: (1) Mentally defective children—such as mongols. (2) Difficult children—where the condition was usually due to environment; for them a child guidance clinic was an urgent necessity. (3) The actual psychotic children; these were sometimes seen at puberty. (4) The epileptic child; these cases were the curse of the out-patient department in all children's hospitals, and as they got older they became more and more difficult at home. Accommodation for all these different types was needed, and it would be an economy to the State were such accommodation provided. Dr. H. J. Eustace referred to mental treatment in Oslo, and said that there alcoholic cases underwent treatment for a year. In Eire one was lucky if one could persuade such patients to stay in hospital for six weeks. One fact which should be borne in on medical men was the necessity for treating alcoholics for a year; real cure could not be hoped for after treatment for any shorter time. At present in Eire a review was being made of the mental defectives in the country, and it was hoped that before long there would be more adequate provision for them, and also schools for mentally defective children. Dr. R. E. Steen said that there were an enormous number of cases of mild nervous disorders in childhood, and he felt that these cases were not recognized and treated in the right way, especially in Eire. The majority of these disorders could be dealt with by parents if they were sufficiently educated; but 1 per cent. were so complicated as to require treatment by a psychologist. For these cases child guidance clinics were essential.

The Student's Training in Psychiatry

Mr. J. C. Flood said that for the next half-century in Eire anything in the nature of mental disease would carry a stigma. Psychology clinics should be separate from the ordinary mental hospitals and should be quite separate from any institutions which housed insane patients. A great deal was being done at present in Eire with regard to mental disease. In the early stage of the medical student's career he had to receive introductory instruction in the possibilities of medical psychology, and it was expected that in his three years' clinical practice he would be taught to assess patients who were suffering from disease and not merely to assess the disease itself. At one time in the recent past the physician had become too much of a laboratory man, and regarded patients too much as a vehicle of disease, but this had now passed. Physicians now regarded patients as an entity, body and mind. In this relation the passing of the old family doctor had been a great loss. As a medical student was nearing the end of his medical course he received instruction in cases which were definitely regarded as cases of mental disease. It was intended by this means to enable the student to recognize the ordinary mental diseases, more particularly those with which he would have to deal by means of certification. Every student at qualification should be capable of recognizing a case of certifiable disease and of determining when the certification should be carried out. This was so at the present time, and therefore he thought that the present teaching in mental diseases was adequate.

INDIA

All-India Institute of Hygiene

In the research sections of the last annual report of the All-India Institute of Hygiene and Public Health a prominent feature is the work on cholera. Statistical inquiries have given no clue to the reason why one district should differ from another in its epidemiological features, taking into account the meteorological factors and the population densities, but definite statistical evidence emerged showing that infection was spreading from infected persons to their contacts, though not to the general population. Case-to-case infection appears thus to play a more important part than infection through environmental channels, irrespective of the density of population, which also did not appreciably affect the mortality rate. An investigation in Calcutta of the value of Rogers's method of cholera forecasting threw doubt on the validity of the critical humidity level. A new method of forecasting which depends on working out the regression equations connecting the mortality in certain weeks of the year with the total mortality for the succeeding year was applied to Calcutta experience, and appeared to be efficient for endemic areas. The epidemic dropsy inquiry at the Institute has led to the conclusion that this disease is caused by some deleterious substance introduced through mustard oil, which is almost universally used as cooking oil in North-Eastern India. References to this work have been published in the *British Medical Journal* as well as elsewhere. This toxic element seems not to be allylisothiocyanate. The poison may be derived from the seed which has deteriorated on account of faulty storage and fungus growth. The existence of a specific disease of mustard seed would explain why epidemic dropsy, as known in India, is confined to consumers of this oil. The toxic substance may, alternatively, be derived from some other seed or oils added to mustard oil in the course of preparation or sale, unwittingly or

deliberately for purposes of adulteration, and this possibility is being investigated. It was found that the surface sterilization of certain types of rice, and particularly of the kind known as "balam," could not be effected by the formalin method which has been advocated by some workers. A statistical analysis showed that there was evidence of a decline in infant mortality in India, but that as compared with Great Britain it was less marked and much more variable. Investigation of the Indian diet revealed a marked increase in the fat intake with the rise in the economic scale, but the diet of the Assam coolies was shown to be poor in total calories and total proteins, in fat, in calcium, in carotene, and to a lesser degree in vitamin C and iron; most of the families took no milk. The heights and weights of the Assam children were much below those of the well-to-do group in Calcutta. While the annual absolute gain in weight was somewhat greater in the Calcutta children, growth expressed as a percentage increase in body weight per year was actually greater in the coolie class in Assam. Much of this annual report is devoted to the steadily progressing research work in all directions, but the training side has not been allowed to slow down, as is shown by the fact that in the year under review the fourth batch of diplomates in public health emerged, thus increasing the number of general practitioners who have public health qualifications, though most of the successful candidates have been absorbed by the State services. There seem to be relatively few openings for laboratory workers, however, and it is suggested that some of the time devoted to laboratory training might be used with advantage for study of public health subjects. A revised syllabus has been prepared accordingly, and certain changes have been suggested in the course for the diploma in maternity and child welfare.

The Pasteur Institute, Coonoor

The thirty-first annual report of the Central Committee of the Association of the Pasteur Institute, Coonoor, Southern India, covers the twelve months ending March 31, 1938. The acting director of this institute, Lieutenant-Colonel K. R. K. Iyengar, I.M.S., supplies a tabulated statement of the mortality from hydrophobia in the Madras Presidency from 1913 to 1937 inclusive, indicating the value of anti-rabic treatment in saving life. The lines on which research work should now proceed are stated as being the obtaining of concentrated rabies virus by cataphoresis methods, and the effect of the administration of vitamins to infected animals; the investigation by culture methods of the nature and identity of the rabies virus is to be pushed more intensively, and a whole-time technician has been appointed, while a special research officer recently took up duties. New subsidiary treatment centres are being opened in the Madras Presidency, and the prophylactic treatment of animals is being intensified. During the fifteen-year period 1923–37 anti-rabic treatment has been given to 3,630 animals, with eighty-eight deaths, a mortality of 2.42 per cent. During the thirty-one years 1907–37 the total number of human patients treated at the Pasteur Institute was 37,030, of whom 392 subsequently died from rabies, a mortality rate of 1.06 per cent. An increased supply of anti-rabic vaccine was issued in 1937 to the subsidiary centres; the mortality was 0.15 per cent. The mortality in 11,307 fully treated cases was 0.12 per cent., and in 2,095 incompletely treated cases 0.33. Of the twenty-one fatal cases reported from the subsidiary centres, twenty patients were Asiatics and one a European. Death followed dog-bite in nineteen cases, while one death was due to fox-bite and one to jackal-bite. The shortest incubation period recorded in 1937 was sixteen days in a dog-bite case, and the longest one was 169 days in a jackal-bite case. Paris-fixed virus was used exclusively in the preparation of the vaccine; it was in its 994th passage at the close of the year. The vaccine employed was Semple's 5 per cent. carbolized sheep-brain suspension.

Correspondence

Sulphonamides in Obstetric Practice

SIR,—In the *Journal* of March 12, 1938 (p. 562), you were kind enough to publish a short account of our experience in the Royal Maternity and Simpson Memorial Hospital, Edinburgh, of the prophylactic administration of sulphonamide. The method was the rough-and-ready one of giving the drug to every patient in the early days of her puerperium for one year and comparing the year's results with those of the three preceding years. The comparison was slightly in favour of the prophylactic medication. But when the experimental period ended and we were faced with having to purchase the drugs (provided gratis by the manufacturers for the experimental year) the formidable expense gave us reason to pause, and we decided to revert during 1938 to the practice of using sulphonamide for therapeutic purposes only. This promised the further advantage of throwing into greater relief any benefits derived from the prophylaxis. I would therefore ask the courtesy of your columns to reproduce the relevant tables with the addition of the corresponding figures for 1938.

1. *Local Uterine Infection*—that is, cases with one or more of the following symptoms: offensive lochia, uterine tenderness, delayed involution, and no other recognizable cause of temperature if pyrexia was present.

1934	1935	1936	1937	1938
165 cases out of 1,991 = 8.2%	193 cases out of 2,016 = 9.5%	150 cases out of 2,188 = 6.7%	139 cases out of 2,241 = 6.2%	130 cases out of 2,186 = 5.94%

2. *Morbid Puerperia* (B.M.A. standard) due to uterine infection.

1934	1935	1936	1937	1938
77 = 3.8%	74 = 3.6%	67 = 3.06%	44 = 1.9%	56 = 2.01%

Further, in 1937 forty-seven patients were transferred to the City Fever Hospital as being frankly infected, of whom two died. In 1938 thirty patients were similarly transferred, of whom three died. This further comparison, therefore, seems on the whole to indicate that no very appreciable advantage was derived from the prophylactic administration of prontosil and proseptasine, which were the drugs used in the experimental year.—I am, etc.,

Edinburgh, March 23. R. W. JOHNSTONE.

Photodynamic Action of Sulphonamide Drugs

SIR,—During the past year I have carried out research regarding the photodynamic action of the sulphonamide compounds. I hope that this work will be published shortly. I have given sulphanilamide tablets to patients who attended the St. John Clinic and Institute of Physical Medicine, Pimlico. In addition, these patients were receiving general ultra-violet irradiation from either a quartz mercury-vapour lamp, a carbon-arc lamp, a tungsten-arc lamp, or my daylight lamp. I have completely failed to find any signs of dermatitis or any other skin lesion in twenty-two patients under observation. Their reactions to the luminous and ultra-violet rays were quite normal.

Laboratory experiments show that the sulphonamide compounds are sensitive to light inasmuch as they are rapidly decomposed when solutions in a quartz flask are exposed to the ultra-violet rays of a quartz mercury-vapour lamp.

Investigations estimating photodynamic action against streptococci, staphylococci, and coliform bacilli, and also the study of haemolysis of a suspension of red blood corpuscles in saline, have completely failed to show any direct photodynamic light-sensitizing action on exposure to luminous or ultra-violet rays. Spectroscopic examination of the sulphonamide compounds shows that they strongly absorb all the wave-lengths shorter than 3,650 Angstrom units, and the compounds are decomposed, precipitating sulphur, with the short ultra-violet rays.

Light sensitization follows from increased sensitivity to the luminous visible rays. The nature of the skin lesions produced is characterized by erythema and oedema, which are later followed by extensive desquamation and repeated exfoliation of the skin. Necrosis may be seen, but the lesions are rarely followed by the pigmentation which is characteristic of ultra-violet irradiation reactions. Patients who are light-sensitive rarely demonstrate abnormal reactions to the short ultra-violet rays, but demonstrate skin reactions with the luminous and long ultra-violet rays. In this way their skin reaction to light is pathological.

In the case described by Dr. Rupert Hallam (*Journal*, March 18, p. 559) it is possible that the erythema reaction produced by the ultra-violet rays may have aggravated the toxic symptoms following the administration of sulphanilamide. But such reaction is quite independent of exposure to light. The toxic skin eruptions following the administration of sulphanilamide can be produced quite independently of exposure to light. So far, skin rashes described as a light sensitization by sulphanilamide have not been fully proven.—I am, etc.,

London, W.1, March 21. ALBERT EIDINOW.

Hormones for Undescended Testis

SIR,—"The hormone treatment of undescended testis is dangerous, useless, and founded on an anatomical error." This is the judgment of Mr. Denis Browne in a letter in your issue of March 25 (p. 641), presumably after considerable personal experience of this therapy. In quoting experimental data Mr. Browne refers to the production of degeneration of the spermatogenic cells and to an interference with fertility in rats' treated with gonadotropic extracts of pregnancy urine. We would like to point out that the only uniformity of agreement among investigators on the response of the male genital system to pregnancy urine extracts is that premature spermatogenesis cannot be induced, and that in spite of acceleration of development, or even maturation, of the genital system the animals do not mate. These opinions are based largely on experiments with immature animals, and there is no evidence that animals treated in this way are adversely affected when they reach natural sexual maturity. In addition, these experiments were performed with extracts from human urine, and there is no evidence that damage to the spermatogenetic cells is caused by extracts from the same species. Finally, we have a patient treated over a long period for undescended testis with pregnancy urine extract who has since not only mated satisfactorily but given ample evidence of unimpaired fertility.

Mr. Browne repeats his statement that a testis which is in the inguinal canal cannot be felt on clinical examination. He also remarks that this statement has never been refuted on the human body, in spite of the fact that we have already published a report (*Lancet*, 1938, **2**, 983) of six patients who were operated on for undescended testis, in whom the testis had been palpable before operation, and at operation was found lying in the inguinal canal. In two of these we admitted the possibility of an emergent testis, but in the other four anatomical abnormalities rendered movement of the testis impossible.

We submit, therefore, that opinions which ignore irrefutable data are dangerous, useless, and founded on erroneous theory—We are, etc.,

A. W. SPENCE.
E. F. SCOWEN.

London, W.1, March 27.

A Short Gestation Period

SIR,—Your account, under the above heading, of a case tried recently before the President of the Divorce Division (*British Medical Journal*, March 25, p. 647) prompts me to put on record an analogous case from my own practice. Getting on for thirty years ago I was in charge of a married primipara, who for no obvious reason came into labour very prematurely. I think I am right in saying that this happened either 186 or 187 days from the first day of her last menstrual period: the duration of gestation was thus probably no more than 182 days, and may easily have been several days less. The child weighed, I think, 2 lb. 3 oz. at birth; it was kept in an incubator for two months. In the early years of childhood it was puny and frequently in my hands for various illnesses, but later on developed into a healthy young woman. I last saw her for some slight illness at the age of 19, when she was rather uncommonly robust-looking. It would be an impertinence for me to offer any comment on Sir Boyd Merriman's judgment; but the similarity of the two cases may be of interest to lawyers who have to advise a client about any such case in the future.—I am, etc.,

London, S.W., March 26. HENRY ROBINSON.

Stilboestrol

SIR,—Enthusiastic and ignorant doctors must be grateful to Dr. H. R. Donald (*Journal*, March 25, p. 641) for enabling them to spend a feverish Friday morning ringing round to take patients off stilboestrol.

My first was a woman of 45 with no sex appeal and little of anything else who was having her third nervous breakdown. Her splitting headaches and dog-tiredness on 1 mg. bis die I had been attributing to the fact that she had "never taken kindly to work."

The second, more interesting and instructive, was a normal healthy woman of 38 who had not menstruated till she was 16½. She had amenorrhoea for nine months and five months after her two confinements, although both children were bottle-fed; her catamenia were always irregular, and are now missing for months at a time. Diagnosed as "the change," she had been "much better" on 3,000 units of menformon bis die. This patient took 1 mg. of stilboestrol at midnight, which caused headache and retching at 5 a.m. After three days she took 1 mg. at noon and 1 mg. at 10 p.m. By 3.30 a.m. she was awake and wretched, by 5.30 retching and collapsed, and at 7 a.m. I was called out to see her.

Let us hope that Dr. Donald will supply a simple test for oestrone in the blood so that the unmusical among us may be protected from the "endocrine orchestra."—I am, etc.,

Highams Park, E.4, March 26. FREDERIC SANDERS.

Classification of Cancer of the Breast

SIR,—When reading Mr. Ronald W. Raven's article in the *Journal* of March 25 (p. 611) I was surprised to find that certain phenomena which I have found to be of great significance were not even mentioned. Perhaps it is because they are so simple that they appear unscientific. Surely the following considerations deserve some place in any practical classification: (1) age of incidence; (2) local tissue reaction to the growth; (3) quadrant—or area—of breast involved.

The following remarks are confined to facts observed by myself during the last thirty years.

1. No case occurring before the age of 30 has survived more than two years—the growths were soft—and no defensive reaction appeared to have taken place in the surrounding tissues.

2. The large amount of fibrous tissue associated with some growths acts as a definite bar to their progress. Ulceration may be regarded as Nature's effort to extrude the growth and is of much less serious import than the occurrence of peau d'orange. When I have removed the breast and underlying fascia, without clearing the axilla, in frail old women with ulcerating, out-growing types of carcinoma, and have grafted the raw area, I have been surprised at the long period of immunity that many of them have enjoyed. No case in which peau d'orange has been present over an equally large area has done well.

3. I very much doubt the accuracy of most anatomical diagrams of the lymphatics of the breast area; they do not sufficiently stress the existence of the "watersheds" that have an undoubted clinical influence. Crossing at the nipple they divide the breast into its four quadrants. At a very rough estimate 50 per cent. of carcinomata occur in: (*a*) the upper and outer quadrant; 15 per cent. in (*b*) the upper and inner; 10 per cent. in (*c*) the lower and outer; 5 per cent. in (*d*) the lower and inner; while the remaining 20 per cent. start (*e*) either beneath or in the nipple. Growths in area (*a*) naturally spread to the axillary and sometimes to the supraclavicular glands, but they only give rise to a small proportion of mediastinal, bone, or intra-abdominal secondaries. Group (*b*) tends to involve the mediastinal glands and, later, the apical axillary and supraclavicular groups. Group (*c*) gives rise to secondaries in the spine, femora, and sometimes the pelvis or pelvic organs; Group (*d*) to intra-abdominal, and more rarely to intrathoracic, involvement. Group (*e*) may, since it involves all four quadrants, spread in any direction.

It would be interesting to learn if the experience of other surgeons differs materially from my own or if it is merely the way of expressing it that varies.—I am, etc.,

Bournemouth, March 26. A. BASIL ROOKE.

Origin of Cancer

SIR,—In the search for a clue to the origin of the cancerous growth one cannot fail to note that two matters of importance stand out: (1) that the type of tissue is of an early primitive character, or at best of a poor, erratic approximation to that of the site of the growth; and (2) its occurrence is in the later years of life. There surely must be some correlation of the two. Fertilization of the ovum results in the activation of its potentials—growth, development, maintenance, and repair. In the process to the completion of the complicated assembly of the varied and differentiated tissues that go to the formation of systems, glands, organs, etc., of the body, certain specialized tissues develop, which have directing or controlling powers on the production of later types—the pituitary, for instance, in its control of the development of the organs of the genital system, and these again in their influence on further developmental processes. Repair of damaged tissues may be reasonably regarded as due to the activation of a primary potential, and normally, as in the healing of an open wound, proceeds in its initial stage by the production of an early type of tissue—granulation tissue—which is later followed by the production of tissue typical of that of the site of injury. It seems justifiable to assume that this is brought about under some directing or controlling agency, which one may further conjecture, on the basis of such knowledge as we possess, to be some hormone or secretion derived from the endocrine system.

That the site of a cancerous growth is so frequently obvious as that of an injury leads one to surmise that it may always be so; where this is not manifest it may be difficult to prove, but is perhaps just as difficult to disprove, inasmuch as the damage may be due to mechanical, chemical, pathological, or other agencies. The initial stage of the cancerous growth is the production of a primitive type of tissue, as in normal repair, but in the later stages the differentiation to the type of the site is poor and erratic. It would seem that under the primal urge to repair the production of an early rapidly growing type of tissue goes on in a lawless way, void of control, and fails to attain the settled stage of maturity. As this occurs in the later years of life the explanation suggests itself that the controlling agent (hormone) is not being produced in the necessary quantity or quality owing to the exhaustion of the secreting tissue, due to age, which may be a varying stage, as the age period of individuals varies. That carcinogenic agents in the experimental production of cancerous growths require prolonged and repeated application to bring this about seems to indicate that the result is attained by an exhaustion of the appropriate secreting tissue. That regression may occur if the irritation is stopped and the hormone supply be re-established after a period of rest of the secreting tissue seems to support the hypothesis submitted.

In the case of the sarcomas occurring in early life it would appear, as the tissue is of the earliest type with little modification, that the controlling agent is absent due to a freakish failure in development of the secreting gland. If what I have submitted hypothetically can be accepted one may conclude that: (1) the cancerous growth is in essence a process of repair which has gone wrong, due to the loss of a controlling agent, and that this agent may be a product of the endocrine system (it may come from the "leader of the endocrine orchestra" or from a less well-known performer); and (2) the search to ascertain the source of this agent may lead the way to the discovery of a cure of cancer.—I am, etc.,

Llansantffraid, March 14. W. H. LEWIS.

Prevention of Coal-gas Poisoning

SIR,—I was pleased to read Dr. E. B. Hazleton's letter in the *Journal* of March 18 (p. 585), but possibly the remedy should be even more radical than that advocated by him. Is not coal-gas an anachronism? If it can be economically rendered non-poisonous, as Dr. Hazleton suggests, there is more to be said for its continued use. But when we consider, first, the annual number of deaths, whether accidental or by suicide, from coal-gas in its present form; secondly, the fact that in contrast to electricity it is oxygen-consuming and sometimes smells; and, thirdly, and possibly most important of all, that exposed gasometers are usually situated in the most thickly populated parts of cities, where bombs falling on them from aircraft may cause widespread fires if not explosions,

one cannot help wondering whether gas should not be relegated to the position of candles and oil lamps, and the energy which it represents be supplied in the form of electricity.

It has been stated that after the earthquake in Napier, New Zealand, more deaths were caused by fires from ruptured gas mains than from the fall of material due to the earth shock.—I am, etc.,

Cardiff, March 17. LAMBERT ROGERS.

SIR,—With reference to the letter from Dr. A. Knyvett Gordon in your issue of March 25 (p. 644) there is no doubt that his suggestion of making gas from the mains irrespirable is a most valuable one. With such a gas all escapes from leaky taps or faulty connexions would be at once recognized and repaired. With regard, however, to the statement that the heating effect of non-poisonous gas is less than that of gas containing a large percentage of CO, this has not been found to be the case at the gas works in Westphalia (Germany) for the production of non-poisonous gas, and it must be remembered that a substance of large heat-producing quality—that is, the carbohydrate CH_4—has been substituted for the CO eliminated. There is also a larger production of coke and benzole, and more tar and gummy substances are eliminated. In the case of air raids large numbers of gas mains would be damaged and the poisonous gas would enter dwelling-houses in large quantities. Gas masks, as at present issued, are no protection against coal-gas poisoning.—I am, etc.,

Birmingham, March 26. E. B. HAZLETON, M.D., M.Ch.

Acute Dilatation of the Stomach

SIR,—Mr. Hamilton Bailey's article on acute dilatation of the stomach was stimulating and provocative; it is a condition which always gives surgeons heartburn. I should be glad if you would allow me to contribute some of my experience of this serious complication. I have never seen the extreme condition Mr. Bailey illustrates in Fig. 5, and I wonder if it is a relic of former days, handed down by the textbooks.

In addition to the points on which Mr. Bailey bases the diagnosis of acute dilatation of the stomach, there are three features I have found useful in detecting the early onset. The first is tension in the abdomen; when it is palpated with both hands resting about the middle on either side, the abdomen feels tight (although it need not necessarily be distended), it moves as if it were "one piece" instead of being soft and dimpling. Secondly, the impression may be formed of something bulky (that is, the dilated stomach) which can be ballotted from side to side; Sir David Wilkie pointed this out to me. Last and most significant, the patient has vomited more than once. It may be only mouthfuls or a retch, and as such is discounted and perhaps not reported by the nursing staff unless a direct inquiry is made. The regurgitation of mouthfuls, however, is sufficient to indicate the condition. A post-operative vomit never empties the stomach, it is only an overflow, and sodium bicarbonate drinks, as often given, will not radically help this either. My working rule is, just as every dog is allowed one bite so patients after an abdominal operation are allowed one vomit; after that, even though it be but a gulp, the stomach is washed out forthwith, the tube is left *in situ*, and the stomach is aspirated hourly, two-hourly, etc., according to the withdrawals. This irrigation is usually required in the first thirty-six hours.

Mr. Bailey's submission that "sounding the stomach is harmless" possibly before vomiting has occurred is scarcely true in my practice. The physical discomfort and mental terror that the procedure sometimes occasions, especially in nervous patients and children, demand that the remedy be used selectively. I think some ejection should be waited for, and then, when a second mouthful is regurgitated, wash out at once. It is a very good post-operative sedative; patients are usually asleep within an hour of it.

In connexion with the technique of the stomach lavage, during the past year my patients have sucked a pastille of decicaine, one grain, twenty to thirty minutes before passing the tube. This renders the oropharynx and the sensitive pharyngo-oesophageal junction anaesthetic. The procedure is rendered painless, and vomiting and retching are almost eliminated. Often have the bed, the nurses, and myself been sprayed with vomit whilst attempting to pass the tube by the nasal and oral routes prior to decicaine, in spite of simultaneous drinks, etc.

As one of the pioneers of continuous intravenous salines, Mr. Bailey advances the claims of his child in acute dilatation of the stomach, but I would make a plea against their routine use here and after major abdominal operations. Like all potent remedies, intravenous infusions have a distinct capacity for harm. Rectal and subcutaneous salines in excess of a patient's requirements can be rejected or unabsorbed, but an intravenous drip given too quickly or too generously will accumulate in the first loose tissue it meets—that is, in the lungs. I have seen more than one "saline" pneumonia which has not always recovered. Among the indications for an intravenous drip are a V-shaped instead of a U-shaped tongue, dry or sticky, and when there is some factor—for example, urgency or peritonitis—which contraindicates the use of the rectum or the subcutaneous tissue. As one stomach wash relieves most patients, intravenous fluid isn't truly necessary on this count. A chart showing the fluid intake and output (that is, the stomach withdrawals plus the urine) is most valuable. If the two are equal, or the output is in excess, I regard this as indicating an infusion, subcutaneous or intravenous.

I do not wish to convey the impression that I deprecate gastric lavage or intravenous salines; I use both frequently; but I do wish to record that my experience (at times chastening) has emphasized that discrimination is essential, and that they should not become standardized routine post-operative measures. It takes a lot of vigilance to guide the enterprise of earnest house-surgeons and nursing staff with aperients, aspirations, enemata, hypodermic injections, and infusions in their approved armamentaria.—I am, etc.,

London, W.1, March 20. HAROLD DODD.

Traumatic Perforation of the Rectum

SIR,—Dr. J. E. Morley's case (*Journal*, January 7, p. 16) of traumatic perforation of the rectum recalls a case which I had occasion to deal with several years ago. The condition, which may be either intra- or extra-peritoneal, is most often due to a fall upon some sharp or spiked object such as iron railing; in the present case the cause was unique—namely, perforation of the rectum by means of the hand throttle control of the handle-bar of a motor-cycle.

The patient, a healthy young farm servant, skidded with his motor cycle, and in the spill which ensued fell upon the handle-bar of the machine, the hand throttle control passing up through the anus. He was seen several hours afterwards and was suffering from shock although able to walk, and was bleeding profusely from the anus. On passing my finger through the anus, which was uninjured, it came to lie almost naturally within a large warm cavity situated immediately in the front of the anterior wall of the rectum, and well forward I could feel the pubic bone.

Under a spinal anaesthetic I stretched the anal sphincter and found a large ragged tear, infiltrated with blood, of the lower anterior rectal wall at its junction with the anal canal. Through the tear the membranous urethra was felt, and it passed across the cavity high and dry like a clothes-line. There were no faeces or pieces of clothing in the rectum or in the wound. After tying off one or two spouting vessels and applying swabs wrung out of very hot saline the bleeding soon ceased, and the rectum and the cavity were swabbed out with acriflavine lotion 1:1,000. The rectal wound was then sutured and closed, save for leaving a small space at its dependent part for removal of an acriflavine gauze drain. A catheter was passed to exclude injury of the urethra or bladder. Anti-gas gangrene and anti-tetanic sera were given. The bowels were confined for several days after the manner following a radical operation for piles, and the drain was removed in thirty-six hours.

An uninterrupted recovery followed. As in Dr. Morley's case, the anus was not injured, but in my opinion the most interesting feature of the case was the remarkable escape from injury of the membranous urethra, which had been dissected up and lay suspended across the cavity leading from the anus.—I am, etc.,

BRENNAN S. CRAN, M.D., F.R.C.S.Ed.,
Surgeon, Highlands and Islands Medical Service.

Fort William.

Treatment of Burnt Hands

SIR,—In the event of an air attack it seems likely that a very large proportion of the casualties will come from A.R.P. fire squads. If so, judging from a recent experience, the parts burnt will be the hands. It takes some time (and experience at that) to bandage the hand and fingers. It occurred to me that much time could be saved by having a large stock of cheap cotton gloves ready. These could be kept sterilized. For use they could be dipped in a watery solution of acriflavine, drawn on, and allowed to dry. The only daily dressing would consist in dipping the hands daily in acriflavine. I have used this dressing for burns (with gauze instead of gloves) for some time, never removing the layer next the burn, with conspicuous success. I have asked our hospital committee to indent for gloves, and commend this idea to others.—I am, etc.,

Great Yarmouth, March 21. LEONARD LEY, M.B., B.Ch.

Unusual Case of Gangrene

SIR,—The following note on an unusual case of gangrene may be of interest.

The patient, a boy aged 10, twenty days before admission to hospital, while tending cattle near his village in a native State bordering on the Central Provinces, trod on a snake, which bit him in the left calf. The snake was brown in colour and was some three feet long. The boy was taken home immediately, and margosa-tree leaves, which are supposed by the locals in that district to have special curative properties for snake-bite, were applied to the puncture wounds, from which blood was oozing. Four hours later the whole of the leg as far as the knee-joint was red and swollen; the patient was in great pain and constitutional symptoms were severe, although consciousness was retained. On the fifth day a line of demarcation appeared below the knee at the level of the tibial tuberosity, and the soft parts of the leg began to slough away. On the fifteenth day the fibula separated off and came away, while on the seventeenth the whole of the foot dropped off. Two days later the patient's general condition had improved, and he was taken to hospital at Saugor for treatment.

When I examined him the whole of the lower extremity, the shaft, and part of the upper extremity of the affected tibia were completely bare, with not a trace of soft tissue. No trace remained of the fibula or any part of the foot, and the patient was using the lower part of the bare tibia as a weight-bearing surface. The soft tissues in the region of the knee were indurated and a slight purulent discharge was present, while the general condition of the patient was good. An amputation was performed through the lower third of the thigh, and the patient made an uninterrupted recovery.

The interesting features of this case are: (1) The nature of the snake. This was presumably of the viperine family, which is apparently very prevalent in the district and is there a common cause of gangrene. (2) The severity of the local and general constitutional symptoms during the earlier untreated stages, followed by recovery. (3) The completeness of the gangrenous process. In a period of less than three weeks practically all the soft tissues of the leg, together with the fibula and the whole of the foot, had sloughed away.—I am, etc.,

M. SENDAK, M.D.,
Captain, I.M.S.; Civil Surgeon, Saugor.

Central Provinces, India.

M & B 693 in Phthisis

SIR,—I have tried M & B 693 in some cases of pulmonary tuberculosis and found that it produces a beneficial effect. My cases were mainly of two types.

(1) *The Active Stage* (where spread of the disease is more active than healing).—In this stage the drug, in most cases, caused a fall of temperature, reduction of cough and sputum, with change in the latter from being purulent to clear mucus. There was usually a marked improvement in well-being. Such toxic effects as morning malaise, tachycardia, and night sweats were considerably relieved, with benefit to the patient.

(2) *Chronic Fibroid Phthisis.*—In long-standing cases, where the physical condition was fairly good but where the patient was troubled with constant cough and expectoration of large quantities of purulent sputum, improvement resulted. By this treatment the cough was reduced and the sputum cleared up, so that from green or yellow it became white or colourless. There was a marked decrease in the amount of sputum coughed up each day.

M & B 693 acts by clearing up the pneumococci, which as secondary invaders of the tuberculous lesions are to a large extent responsible for the toxaemia of phthisis. I have found that the best method of administration is to commence with one tablet (0.5 gramme) four times a day after food for three days and then reduce to one tablet night and morning. Later one tablet each night may be sufficient. So far I have found it essential to maintain a dosage of at least one tablet each day, otherwise the former symptoms are liable to recur, although not to such an extent as before the treatment. None of my patients experienced severe reactions.

Thus M & B 693 has a beneficial effect on certain cases of pulmonary tuberculosis: (*a*) it inhibits the growth of pneumococci in the distressed tissues, (*b*) it relieves unpleasant symptoms, distressing to the patient.—I am, etc.,

JAMES DEENY, M.D., M.R.C.P.I.

Lurgan, Co. Armagh, March 22.

Incidence of Psychoneurotic Illness

SIR,—I note that Dr. E. A. Bennet raises objections to my nomenclature in his letter (March 11, p. 534). Doubtless there is much to be said for those objections. My main purpose, however, was to condense my findings into as brief a letter as possible. To stop and define one's terms is not conducive to brevity and the risk of misunderstanding is run.

I am quite clear that the figure 11.65 per cent. is, if anything, on the small side, even when dealing with working-class patients, who are less liable to neuroses than the middle classes, who carry greater responsibilities.

In a dispensary one sees new patients who have had no time to elaborate their symptoms. For those, I submit that a simple rational psychotherapy suffices to clear up the symptoms. The test of recovery is that the patient feels well and goes back to work. To one who is struggling daily with severe conditions involving obsessions and phobias which require analysis the early case seems almost too easy of treatment, but, with certain caveats, the one recovery is as authentic as the other.

As regards my term "mental trauma," I had thought I was simplifying things that way. Many people like the word "psychological," which is wider in its sense and content. There are others who suspect it of being as difficult to understand as it is awkward to spell. Trauma is borrowed from surgery. I mean by "mental trauma" any sudden experience occurring in consciousness which disturbs the emotional or affective part of the patient's mind. I feel sure that during these phases of experience patients show increased suggestibility and many become manifest neurotics. More often than not an analysis may show latent mental conflict in all neurotics of any serious length of illness. But surely it is justifiable to try the simpler treatment first. Its futility will soon be manifest if it fails. The symptoms remain.

Dr. Bennet is correct in his surmise as to what I mean by psychoneurotic illness. I mean any illness (apart from a frank psychosis) arising from a system of ideas and not from an organic pathological process. But the time may come when there will be a nomenclature agreed upon by all workers in this field. Meantime each uses his own classifications and subgroupings without any damage to the patients, if some occasional confusion among ourselves.—I am, etc.,

Glasgow, March 22. CHARLES SHEARER.

International Co-operation in Science

SIR,—You have given publicity in your issue of March 25 to a laudatory note from a correspondent who has been enjoying the hospitality of the Research Institutes of the Kaiser-Wilhelm Gesellschaft at Dahlem. In his opening statement he says it is pleasant to record that a definite step for the preservation of international co-operation in science has been taken by the Kaiser-Wilhelm Gesellschaft, which has arranged with the Royal Society an interchange of visits between scientists of the two countries. If one could forget the plain fact that Germany and Italy by their persecution of non-Aryan scientists can no longer be regarded as countries really concerned with international science one could welcome such *rapprochements*; but can the British scientist visiting Germany (or Italy for that matter) really forget this plain fact and so feel at home in a now attenuated scientific atmosphere purged of its non-Aryan elements, whose very science is held to be peculiar and inferior? Can, in fact, truly international scientific congresses take place in Germany or Italy? I think not.

At the opening of the Pasteur Institute in 1888 Louis Pasteur concluded his speech, which was read for him by his son, with these words, and I heard some of them repeated at its jubilee celebrations ten days ago:

"Si la science n'a pas de patrie, l'homme de science doit en avoir une, et c'est à elle qu'il doit reporter l'influence que ses travaux peuvent avoir dans le monde. S'il m'était permis, Monsieur le Président, de terminer par une réflexion philosophique provoquée en moi par votre présence dans cette salle de travail, je dirais que deux lois contraires semblent aujourd'hui en lutte: une loi de sang et de mort qui, en imaginant chaque jour de nouveaux moyens de combats, oblige les peuples à être toujours prêts pour le champ de bataille, et une loi de paix, de travail, de salut, qui ne songe qu'à délivrer l'homme des fléaux qui l'assiègent. L'une ne cherche que les conquêtes violents; l'autre que le soulagement de l'humanité. Celle-ci met une vie humaine audessus de toutes les victoires; celle-là sacrifierait des centaines de mille existences à l'ambition d'un seul. La loi dont nous sommes les instruments cherche même à travers le carnage à guérir les maux sanglants de cette loi de guerre. Les pansements inspirés par nos méthodes antiseptiques peuvent préserver des milliers de soldats. Laquelle de ces deux lois l'importera sur l'autre? Dieu seul le sait. Mais ce que nous pouvons assurer, c'est que la science française se sera efforcée, en obéissant à cette loi d'humanité, de reculer les frontières de la vie."

Science should be above mere time-serving politics and, to my mind, the scientist who participates in these arranged gatherings, and in so doing appears to condone the inhumanity perpetrated by his hosts on his brother scientists, lays himself open to frank criticism. When he does so participate he becomes a political partisan. Far better that he hand over what he might otherwise spend in Germany (or Italy) to the Society for the Protection of Science and Learning.

As for the visiting Aryan, might I ask your correspondent whether the inevitable contacts with one-time confrères now ruthlessly banished from a common fatherland are likely to make his visit here enjoyable?—I am, etc.,

Lister Institute, London, March 25. J. C. G. LEDINGHAM.

Appliance for Variable Counter-balancing

SIR,—My attention was drawn to a short article, with illustration, published in the *Daily Sketch* of March 8. The illustration reproduces an apparatus for treatment so closely resembling the one I introduced in the later stages of the war for gradual mobilization of knee-joints that it is strange that the recent article should describe this as the invention of the doctors at the Hospital for Sick Children, Great Ormond Street.

My method of variable counter-balancing was given in the *British Medical Journal* of August 24, 1918, and in the *British Journal of Surgery* of April, 1919. In the former article, entitled "Restoration of Function after Penetrating Wounds of the Knee-joint," I described that my reason for this gradual passive movement was to prevent a flare-up of sepsis liable to result from more forceful movements and the rapid breaking down of adhesions. In the latter article—"A New Method of Treatment for Suppurative Arthritis of the Knee-joint"—the device was used simply to facilitate active movements of a lower extremity by counteracting the weight of the whole limb. The hour-glass principle for varying counter-balancing weights appeared reasonable to me, and the possibilities were simplified from the fact that our hospital in France was on a golf course where plenty of sand was at my disposal. I made the funnels myself from conical-topped oil drums.

Needless to say that having devoted myself to a totally different specialty I have not had opportunities in the last eighteen years of pursuing this interesting subject, and had, in fact, almost forgotten this work until seeing this recent article.—I am, etc.,

London, W.1, March 23. JOHN EVERIDGE.

Shock Therapy

SIR,—This correspondence is developing into something like a comedy of errors. May I summarize it by saying that Dr. Horace Hill thinks that histamine matters—and I don't!—I am, etc.,

Bucks County Mental Hospital, March 25. IAN SKOTTOWE.

Obituary

ROY DOBBIN, M.D., F.R.C.P.

Professor of Midwifery and Gynaecology, Royal School of Medicine, Cairo

We regret to announce the death on March 20, in Cairo, of Professor Roy Samuel Dobbin, O.B.E., who had occupied for some years the chair of midwifery and gynaecology in the Royal School of Medicine, Cairo, and was obstetrical surgeon and gynaecologist to the Kasr-el-Ainy Hospital. A student of Trinity College, Dublin, he graduated M.B., B.Ch., and B.A.O., with distinction, in 1899, and graduated M.D. in 1903. He was elected a Fellow of the Royal College of Physicians of London in 1932, and was one of the first Fellows of the Royal College of Obstetricians and Gynaecologists.

Dr. John S. Fairbairn writes:

It is the least worldly of men whose death seems to their intimates to leave the world the poorer. Roy Dobbin was such a one, with an undue proportion of selflessness in his make-up. None could meet him without feeling almost at once the kind and lovable nature of the man. Closer acquaintance but served to bring out his deep thoughtfulness for friends and for all mankind. This characteristic was exemplified during his last illness by his great concern that his colleagues and friends should not be distressed by learning of its gravity. Being in frequent correspondence it is possible for me to say that nothing so often called forth a letter from him as an opportunity to serve someone he thought deserving. The last received—some six weeks ago—was primarily a plea of that kind, written in his expansive script but enclosing a typed summary in support thereof.

Dobbin's life's work was done in Cairo for the Royal School of Medicine, which he served as professor of obstetrics and gynaecology, and did much to advance the high repute of that department and its teaching. He loved Egypt, and its atmosphere developed his historical sense and expanded his archaeological bent. Beginning early to collect the classical literature of midwifery, he acquired a fine and valuable library and a wide knowledge of books and writers. Like most bibliophiles he strayed from the narrow path of his primary objective—shown by his interest in Servetus, copies of whose theological works were among his treasured possessions. Besides his colleagues and friends in the city of his adoption who mourn his loss, Dobbin had in this country a devoted band of friends who grieve at his passing; especially in the Royal College of Obstetricians and Gynaecologists will there be deep sorrow at the loss of a devoted benefactor. Feeling strongly the need for a body of the kind, Dobbin threw himself heart and soul into the movement for its foundation, and later made its library his particular charge. Learning that the College had been given £500 by Lady Simson for a memorial to her husband, Sir Henry Simson, he offered the College for that sum a collection from his library of books that was estimated to have cost £1,100. In addition many gifts to the library have been made, and during the last year more than a dozen were received, including an incunabulum of Rhazes and a work of Servetus—Liber VII of *De Trinitatis Erroribus*.

Dr. Arnold Chaplin sends the following appreciation:

Full attention has been paid to the important position occupied by Professor Roy Dobbin as an obstetrician and as a gynaecologist, and I trust you will allow me a small space to pay a tribute to his outstanding qualities as a man and as a scholar. Although a man of great learning he was always ready to listen, almost with humility, to the opinion of others far behind him in erudition, and few could be in his society for long without being captivated by his charm of manner and real kindness of heart. As a polite letter-writer he had few equals, and many long letters received by me are models of what such letters should be—written in very correct English, informative, and interesting. Very early in his career Professor Dobbin acquired an intense and abiding love for early printed books and manuscripts, dealing chiefly with obstetrics and gynaecology. He soon collected a large and valuable library, and became a munificent supporter of the growing library belonging to the Royal College of Obstetricians and Gynaecologists, which he enriched with many valuable books. He also gave to the library of the Royal College of Physicians many Arabic manuscripts of great interest and value. Professor Dobbin's many friends will mourn the passing of this kindly and cultured gentleman.

W. I. CUMBERLIDGE, M.B., F.R.C.S.

Senior Honorary Surgeon, Leicester Royal Infirmary

We regret to announce the death on March 20 of Mr. William Isaac Cumberlidge, who had a high reputation as a surgeon in Leicester and the surrounding district. He was born at Eaton, Cheshire, on January 6, 1880, son of the late H. J. Cumberlidge, J.P., of Hyde, and from Macclesfield Grammar School went to Christ's College, Cambridge, graduating B.A. with honours in both parts of the Natural Sciences Tripos. He was a scholar of Christ's, and won a scholarship at St. Bartholomew's Hospital, where he continued his medical studies and qualified with the English conjoint diplomas in 1904. After serving as house-surgeon and extern midwifery officer at Bart's and casualty officer at the London Temperance Hospital, he took the F.R.C.S.Eng. in 1907 and the M.B.Camb. in 1908, and was for two years house-surgeon to the Leicester Royal Infirmary, where he was appointed to the honorary surgical staff in 1911. Mr. Cumberlidge was a member of the Association of Surgeons of Great Britain, and had joined the British Medical Association in 1909; he held office as chairman of the Leicester and Rutland Division in 1925–6 and as president of the Midland Branch in 1922–3.

A colleague of many years' standing writes: Of William Isaac Cumberlidge it may be said, more than of most men, that he had early in life set for himself a course which he afterwards steadily pursued. His ambition was to become a surgeon. How far he succeeded the friendship of his colleagues and the affection of his patients could amply testify. As house-surgeon in the Leicester Royal Infirmary his ability and his devotion to duty ensured his election as honorary assistant surgeon, and, later, as full surgeon to the hospital. He was ever attentive, even punctilious in the discharge of his duties. He practised a rigorous asepsis in his operative work. He was careful in the making and the keeping of appointments. Perhaps one secret of his success was that he was always dependable. He possessed a gravity of speech and deportment which, while he was young, made him seem older than his years and which, as he grew older, conferred a dignity associating with an age longer than that to which he was permitted to attain. For just a year before he should have retired from his hospital appointment, and when he might have looked forward to many happy years of

comparative leisure, he was taken, many of us think too soon. But he leaves behind him the memory of one who never shirked a duty, who was in love with his profession, who was the soul of hospitality, who was a loyal friend, and who was never heard to say an unkind word of anyone. In the great war he was captain in the R.A.M.C., and was attached to the 5th Northern Base Hospital in Leicester. He volunteered to serve abroad, and spent many months at St. Omer and other hospitals in France. He never married: he lived a quietly happy life with his mother and two sisters, to whom the sympathy of all who know them will be generously given. He was fond of Nature and of walking in beautiful scenery. He was attracted by Freemasonry, and he was a P.M. of his Lodge, a P. Prov. G. Registrar and P.Z. At the time of his death he was Prov. G.S.W. of the Province of Leicestershire and Rutland.

SIR HENRY LUNN, M.A., M.D.

As announced in the *Journal* last week, Sir Henry Lunn died on March 18. He was 79 years of age.

Henry Lunn was so conspicuous in such fields of activity as travel agency, religious organization, politics, and peace crusading that it was often forgotten, especially after he was knighted in 1910 and no longer known as "Dr. Lunn," that he was a member of the medical profession. The way in which he got the money to enter as a student of medicine is worth recounting. He was brought up in a strict Methodist home in Lincolnshire. When 17 years of age he was the victim of a three-card trick, and rather than confess his loss to his austere father he decided to regain the money by trading on a small scale in outfits for the new game of lawn tennis. He had such business aptitude—as was abundantly proved throughout his life—that he was presently able to dispose of this little business to his father for £1,000, and with this money he entered Trinity College, Dublin, where he graduated M.D. in 1887. In the same year he married and went out to India as a medical missionary, but recurring attacks of fever soon put an end to all dreams of service in the East, and he was compelled to return home. He then devoted himself to militant work in the Methodist Church in London, but always his sympathies were wider than the one communion, and he set himself to the cause, for which he laboured for half a century, of the reunion of the Churches. He founded the first Grindelwald Conference in 1892, and also convened later the Mürren Conference of bishops, clergy, and leading Nonconformists, and the Stockholm and Lausanne Conferences. These were scornfully described as "ecclesiastical picnics," but they did contribute to better understanding among men sharing a common faith. Incidentally, they brought out Lunn's genius for organizing tours, and he became a pioneer in group holiday travel to Switzerland, and later on to Italy, Palestine, and other countries.

In the political field Sir Henry Lunn was less fortunate. He twice attempted to enter Parliament, once for a constituency in his native county, but on both occasions he was unsuccessful. He was a Liberal of the old school, and in his undergraduate days at Dublin his championship of Home Rule resulted in the wrecking of his rooms by equally ardent opponents. Just before his death he severed his connexion with the Liberal Party on the ground that its leaders were pursuing a warlike policy. He was at all times an opponent of war and a fervent internationalist. In 1926 he undertook a world tour as vice-president of the League of Nations Union, primarily to deliver the Sulgrave Manor Institution Lecture on the birthday of George Washington, but also to "harness the Churches" in all the countries he visited to the League of Nations. He announced in New York that he had divested himself of the greater part of his property in order to form a trust for the benefit of all movements connected with Church unity and international peace. Among other causes to which he devoted himself was that of the Assyrian Christians in Iraq, for whom he was instrumental in raising a sum of £22,000.

Many books, mostly of a religious character, came from his pen. His autobiography, published in 1934, is full of infectious optimism and a gaiety of spirit which seemed to grow on him with advancing years.

J. L. JOYCE, M.B., F.R.C.S.

Surgeon, Royal Berks Hospital, Reading, and Wingfield-Morris Orthopaedic Hospital, Oxford

Mr. Leonard Joyce, who died on March 18 at Reading, was a first-rate surgeon whose main work was done at the Royal Berkshire Hospital, but his private and hospital practice extended over a wide area in Berkshire and the neighbouring counties.

Born at Coreley, Salop, on January 13, 1882, the son of Prebendary J. B. Joyce of Tenbury, James Leonard Joyce was educated at Shrewsbury School, King's College, Cambridge, and St. Bartholomew's Hospital; he graduated B.A. with first-class honours in Part I of the Natural Sciences Tripos of 1904, qualified as M.R.C.S., L.R.C.P. in 1907, and two years later took the M.A., M.B., B.Ch. degrees at Cambridge and the F.R.C.S.Eng. diploma. At Bart's he won a senior scholarship and served as house-surgeon and extern midwifery officer. In 1909 he began general practice at Reading as a junior partner with the late Dr. Jamieson B. Hurry. During the war he held a temporary commission in the R.A.M.C. and became officer-in-charge of the surgical division and officer-in-charge of the special military surgical section of the Reading War Hospital, retiring with the rank of brevet major. At the Royal Berks Hospital he was at first assistant surgeon and then full surgeon, and he was honorary consulting surgeon to a number of smaller institutions in the neighbourhood, including the War Memorial Hospital at Henley-on-Thames, the Ivor Cottage Hospital at Marlow, and the District Cottage Hospital at Newbury; he was also honorary surgeon to the Wingfield-Morris Orthopaedic Hospital and to the Park Prewett Mental Hospital at Basingstoke. Mr. Joyce's standing and personality were recognized by his appointment as vice-president of the Section of Surgery at the Oxford Meeting of the British Medical Association in 1936; he had joined the Association in 1911, and for the past five years served on the Consultative and Special Group Committee for England and Wales.

Professor G. R. Girdlestone writes:

Mr. J. L. Joyce's death is a great loss to surgery and a far greater and more personal loss to those who were fortunate enough to know him well. Leonard Joyce and I saw a good deal of each other during 1918 and 1919. He was in charge of the War Orthopaedic Surgery in Reading and I of that in Oxford. As time passed our friendship grew deeper and happier. Too busy to meet often, we welcomed the opportunity of being together which meetings of the Association of Surgeons and of the British Orthopaedic Association afforded. By his unselfish help he made it possible for the area of Berkshire, Buckinghamshire, and Oxfordshire to be associated with the Wingfield-Morris Orthopaedic Hospital. As a surgeon he was of outstanding quality, great in technique and

accomplishment, but outstanding on account of his character, his care and conscientiousness, and his beautifully balanced judgment. He was never distracted by false values. He was the truest and most modest of men. I have known him as his colleague, as his grateful patient, and, I am thankful to say, as his friend for twenty years. He was always the same, a charming companion, and the best friend a man could have.

MERCIER GAMBLE, M.D.

Medical Superintendent, Withington Hospital, Manchester

We announce with regret the death on March 14 of Dr. Mercier Gamble, M.B.E. He was the son of Samuel Gamble, a steel manufacturer of Sheffield, who provided several attractive scholarships in the University of Manchester for women students of medicine. Mercier Gamble was a student at Owens College, and graduated with honours in 1901. He then held resident posts in the Royal Infirmary, the Salford Royal Hospital, and the Southern Hospital for Women and Children. This was before the amalgamation of the Southern Hospital with the much older St. Mary's Hospital. In 1905 he received a gold medal for his thesis for the M.D., his subject being the clinical estimation of the alkalinity of the blood. The work for this thesis was carried out at the University and at the Manchester Royal Infirmary, partly under the observation of his former chief at Salford Royal Hospital, Professor Dixon Mann, and in 1906 it was published in the *Journal of Pathology and Bacteriology*. Some time was next spent as a surgeon in ships of the Blue Funnel Line on their eastern voyages. Medical missionary work attracted him then; as a preparation for it he took the course in tropical diseases at the London School of Tropical Medicine and Hygiene, and received the certificate of the School for this subject in 1907. From 1907 to 1913 with intervals of leave he was a voluntary medical officer at the Baptist Missionary Society's hospital at San Salvador in the Portuguese section of the Lower Congo Basin, a district ninety miles from Matadi, the port of the Belgian Congo. There he had a dispensary attendance of 30,000 per annum, but in addition to this work his early entomological interests led him to make a collection of the blood-sucking arthropods of the district, a list of which he published with a vocabulary of native terms in the *Journal of Tropical Medicine and Hygiene* in 1914. This collection was passed through the Imperial Bureau of Entomology and is now in London. He also sent a collection of fleas to Lord Rothschild. He published a paper on sleeping sickness in the Portuguese Congo, in which he recorded his experience of treating the disease with atoxyl.

When he was at home on leave for six months the war broke out and he joined the R.A.M.C., and was appointed to take charge of the large military hospital in the Poor Law hospital at Withington, Manchester. After the armistice he became one of the physicians to the hospital, and later succeeded to the post of medical superintendent, continuing in the office after it became a municipal hospital. Dr. Gamble had been a member of the British Medical Association for thirty-five years. He was also an honorary lieutenant-colonel in the R.A.M.C., a vice-president of the Manchester Medical Society, and a vice-president of the Manchester Geographical Society.

WILLIAM JOHN DODDS, M.D., D.Sc., died at Prestwick, Ayrshire, on February 14, aged 84 (writes F. C.), and I have not seen any note of appreciation for the magnificent service he rendered to mental medicine while he was Commissioner of Lunacy and superintendent of Valkenberg Asylum for years in Cape Colony. I knew him for more than fifty years, first in Montrose Asylum, where he was my senior on the staff, and later while we were both in the medical service of the Cape Government, where he was the pioneer of all modern legislation for the insane. Modesty prevented him earning the reward he deserved. A few years ago I dined with the Lord Chief Justice in Port Elizabeth and told him how remiss I thought the authorities had been to allow Dr. Dodds to retire with no public recognition of his outstanding public services. The Lord Chief Justice seemed to recognize the pity of it at once, and all the excuse he offered was that "Dr. Dodds was such a modest man and had never emphasized his own importance." He was a good husband, a good father, and a good friend. To him I owe much of the happiness I have had in life from my early association with him, and the width of vision which has been of such satisfaction to me all these fifty-odd years is due entirely to his interest when I was a young graduate. Perhaps he has outlived his generation, and we forget the prophets. But as a profession we would be neglecting to give the honour that is due if we failed to put on record our appreciation of a man who did so much in a colony where he brought the care of the insane up to the standards of the best in the mother country. He had been a member of the British Medical Association for forty-eight years.

Universities and Colleges

UNIVERSITY OF OXFORD

On the recommendation of the examiners the Master and Fellows of University College have awarded the Radcliffe Prize to F. Hawking, D.M., of University College.

UNIVERSITY OF LONDON

At a meeting of the Senate held on March 22, G. A. D. Haslewood, Ph.D., M.Sc., was appointed to the University Readership in Biochemistry tenable at Guy's Hospital Medical School as from May 1.

The degree of D.Sc. was conferred on Mrs. M. F. Lucas Keene, M.B., B.S., professor of anatomy at the London (Royal Free Hospital) School of Medicine for Women.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN

The following postgraduate scholarships will be awarded for the session 1939-40: (*a*) A. M. Bird Scholarship. £200 for one year to enable a medical graduate to obtain general experience in pathology. (*b*) Mabel Webb and A. M. Bird Research Scholarship. £200 a year for assistance in carrying on research. Further particulars and forms of application can be obtained from the warden and secretary of the Medical School. Applications must be received by May 20.

UNIVERSITY OF LEEDS

The following candidates have been approved at the examinations indicated:

M.D.—‡T. Simpson, D. M. Leiberman, N. Lissimore, K. O. Milner.

FINAL M.B., CH.B.—*Part II:* *J. M. Fitton, *C. Pickard, *P. E. R. Tattersall, †C. E. Astley, †P. D. Bedford, †Patricia M. Dobinson, †J. Hirst, †F. Jennings, †S. A. Swanson, †R. P. Warin, †K. D. Wood, A. N. T. Aikman, A. Colbert, J. B. Coltman, E. Cope, F. Debney, R. G. Denniss, Ruth Edmonds, M. Goldberg, F. Gouldsborough, A. Green, H. J. M. Holland, J. Jackson, Adelaide J. G. James, R. E. Johnson, H. Levine, D. E. Mitchell, I. G. W. Pickering, J. D. Pickup, T. B. Purdy, G. N. Reed, J. V. Schofield, Helen M. Secker, F. N. Shuttleworth, Ida M. Shuttleworth, S. A. Smith, E. S. Tan, A. L. Taylor, P. J. Waddington, I. Young.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Janet F. Henderson, Joyce E. Marshall, M. W. Robinson.

* With first-class honours. † With second-class honours. ‡ With distinction.

The following scholarships and prizes have been awarded:

Infirmary Scholarship: H. Gray and G. M. Williamson (divided). *Littlewood Prize in Anatomy:* Kathleen M. Harrison. *Hardwick*

Prize in Clinical Medicine and McGill Prize in Clinical Surgery: J. M. Fitton. *Prize in Anatomy and Physiology in Relation to Obstetrics and Gynaecology and Edward Ward Memorial Prize in Surgical Anatomy:* C. Pickard. *Hillman Prize in Clinical Medicine:* J. K. Drucquer.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.—*Part A:* J. H. Fairweather, B. M. Maxwell.

DIPLOMA IN PUBLIC HEALTH.—Part I: J. C. Birchall, C. Coleiro, E. C. R. Couper, J. N. Das, Beryl Edgecombe, Ivy F. Fallon, Elsie O. Hughes, J. Leiper, F. T. Madge, E. H. Moore, Moira Murray.

DIPLOMA IN TROPICAL MEDICINE.—J. J. Barton, B. S. Baswani, T. G. Burnett, J. M. Caldwell, G. N. Dholabhai, L. G. Eddey, *A. H. T. F. Fullerton, W. Hunter, S. D. Khalil, V. N. Khanna, J. Koniszewski, E. Kowalsky, W. H. R. Lumsden, K. Nadarajah, H. Nelson, *T. E. Ooi, T. S. Outerbridge, W. A. de Pay, R. Singh, A. Sundrampillai, L. Teeluck.

DIPLOMA IN TROPICAL HYGIENE.—A. S. Affara, L. J. Charles, H. N. Lee, H. R. R. E. Ramesar, A. H. D. S. de Silva.

* Recommended for Milne Medals.

UNIVERSITY OF SHEFFIELD

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—*Parts II and III:* *E. F. Edson (distinction in surgery), † D. Bradbury, Ailsa B. Atkinson, P. Baker, Una M. Campbell, H. Cohen, L. Debovitch, H. R. W. Hawson, J. H. Hazeldene, W. F. Mindham, B. Ravitz, F. R. Zadik.

* With first-class honours. † With second-class honours.

Medical Notes in Parliament

The House of Lords has completed its consideration of the Cancer Bill and returned it to the House of Commons. The business of the House of Commons this week included the Unemployment Insurance Bill, the Camps Bill, the Reorganization of Offices (Scotland) Bill, and the Marriage (Scotland) Bill.

The Royal Assent was given on March 27 to the Mining Industry Welfare Fund Act, the Defence Loans Act, and other Acts.

In the House of Commons on March 28 the Hairdressers (Registration) Bill was read a first time and the Charitable Collections Bill passed through standing committee with amendments.

The Parliamentary Science Committee dinner was held on March 28 at the House of Commons. The Earl of Dudley (president) occupied the chair, and the principal guest was Professor E. V. Appleton, secretary of the Department of Scientific and Industrial Research. Those present included presidents and secretaries of institutions affiliated to the committee.

Cancer Bill

The House of Lords went into committee on March 21 on the Cancer Bill. The Duke of Devonshire accepted for the Government an amendment moved by Lord ELTISLEY on behalf of the County Councils Association. This proposed in Clause 1 (Duty of local authorities) to take away the power of the joint committees to co-opt up to one-third of their personnel independently of the local authorities, and to provide that before co-option was allowed the assent of those responsible for setting up the committees must be obtained.

ADVERTISEMENT OF CANCER "CURES"

On Clause 4 (Prohibition of certain advertisements) Lord BERTIE OF THAME moved to insert a proviso that the prohibition of advertisements should not apply to "reports or accounts of treatments for cancer issued or published, orally or otherwise, by registered or unregistered practitioners, to persons or in publications other than those enumerated in paragraphs (*a*) and (*b*) of subsection (4) of this section." He said registered practitioners had the medical press in which they could express their opinions, but the unregistered practitioner had no such outlet to make known to the public his discoveries, however useful they might be. The Solicitor-General had said he would not initiate prosecutions against nature curers, herbalists, and members of religious bodies, but the time might come when one of the successors of that Minister had started life as a registered practitioner and was consequently prejudiced against all unregistered practitioners.

The DUKE OF DEVONSHIRE said the Government could not accept this amendment, which would leave so little of the clause that it would not be worth while having the clause in the Bill. Fears had been expressed that the clause unamended might make it illegal for Christian Scientists at their meetings to prescribe treatments which had proved successful. He would look into that point before the third reading, but that was not the intention of the Government, which did not wish to prohibit or interfere with the meetings of Christian Scientists or of any other religious body.

Lord MAUGHAM said the House must weigh on the one hand the chance that there might be some person who had discovered something of value, which would not be established for years after his investigations began, and on the other the damage that would be done by people who, for gain, made reckless statements as to the cure which they were in a position to offer the public. The clause was really necessary in the interests of the public. If a person discovered what he thought to be a remedy he could not himself advertise it, but if he produced his evidence before three or four competent people with training in medical and surgical matters he could get these people to investigate the claim. As soon as they had investigated it they would have no difficulty in advertising the matter in one of the registered medical papers referred to in Clause (4) (*b*).

Lord Bertie of Thame withdrew his amendment. Clause 4 and the remaining clauses were then agreed to and the committee stage ended.

The report stage of the Cancer Bill was taken on March 23. The DUKE OF DEVONSHIRE said he was now advised that nothing in the Bill would make it illegal to give testimonies as to the healing of cancer by Christian Science at testimony meetings or to publish them in the textbook or other authorized literature of the Church of Christ Scientist, provided no announcement was made that any practitioner was prepared to treat other cases. There was no risk that publication of a list of Christian Science cases, in conjunction with evidence of testimony, might be taken as advertising a cure.

The report stage then concluded.

The Cancer Bill was read a third time by the House of Lords on March 27 and returned to the House of Commons.

On March 28 the House of Commons, after brief discussion, agreed to the amendment made by the House of Lords in the Cancer Bill.

Health and Nutrition

Nutrition was the subject chosen for discussion when the House of Commons took the third reading of the Consolidated Fund (No. 1) Bill on March 23. Mr. LEES-SMITH said the Labour Party wished to raise the problem of the nutrition of the people, particularly on account of the recent researches on this subject by the medical profession. His party criticized the attitude which Government Departments were taking towards this new science of nutrition. The medical view was that half the people were sent into the world with jerry-built bodies, and that no amount of dosing would give them a sound structure in which to pass the rest of their lives. The Board of Education decided malnutrition by clinical assessment, which meant judging the child's nutrition by looking at it, but doctors said the results were fantastically wrong. They put forward an alternative method of calculating the quantity of proteins, vitamins, and so on required by children at different ages for a full standard nutrition, and then calculated what it cost per week to buy the food which would secure this. The British Medical Association said that nearly 6s. a head a week must be spent on food by a family to obtain a proper standard of nutrition. Nearly 30 per cent. of the

population of the country spent less than 6s. a head a week on food, and therefore at least 30 per cent. of the children suffered from malnutrition.

COST OF ILLNESS

Dr. HADEN GUEST said something like 10 per cent. of the adult population lived in bad conditions of housing, etc. The cost of illness in this country, medical and surgical, was something like £300,000,000; at least one-half of that was attributable to some form of malnutrition. As a consulting school medical officer of the London County Council he had carried out the first feeding experiment before the war in London. His experience convinced him that the idea that an absolute standard of nutrition could be set up was an illusion. The British Medical Association did not agree with the Ministry of Health's standard of what was necessary to spend on food to give a minimum standard of nutrition. Sir John Orr had told him that to provide the amount of milk necessary for consumption by children of 1½ pints a day and by mothers of 2 pints a day the dairy herds of this country would need to be increased by 33⅓ per cent., and all the milk would have to be consumed as liquid milk.

Dr. ELLIOT replied that unless the homes and circumstances of the wage-earners were adequate *ad hoc* measures in the schools would not suffice. Neither he nor Mr. Lindsay regarded the clinical assessment of children as a satisfactory or absolute test, but if that test were dropped out of the school reports the House would demand some sort of assessment by medical officers on the condition of the children. The Government had not stopped at investigation. It had taken action on the newer knowledge of nutrition, and the result was marked improvement in the health of the nation. It was anxious to adopt every possible method of making milk safe for drinking during the period before they achieved the ideal of perfectly clean cows none of which was infected with tuberculosis. He would not go into pasteurization, because a proposal brought forward by the Government in that direction had not met with acceptance in the House and the Government had to re-examine the question. The consumption of dairy products had increased in the United Kingdom and the consumption of milk had also gone up among children and among patients in institutions. Consumption of liquid milk increased in England and Wales between 1936–7 and 1937–8 by 35 million gallons, which showed the value of propaganda. The number of attested herds had risen rapidly, and the State veterinary service was carrying out routine examination of milk herds in all counties.

No one could deny that in the lower classes malnutrition arose from inability to afford adequate supplies of the protective foods, but this was not the only factor, as had been pointed out by the committee which reported on the anti-tuberculosis service in Wales. He was carefully watching the relationship between rents in new housing estates and nutrition, but subsequent investigation had not borne out the work of Dr. M'Gonigle on that subject. Out of 412 authorities in England and Wales 407 were supplying milk free or at less than cost price to expectant mothers, 409 to nursing mothers, and 407 to children under 5. After the issue of a circular in April, 1939, asking local authorities to review their arrangements for a supply of milk, seventy-seven authorities had increased the quantity of milk supplied, 152 authorities had extended the period of supply, and sixty-two had adopted a more liberal income scale. Schemes for provision of milk in factories and mines now covered 2,139,000 persons. Statistics of infantile mortality, maternal mortality, and tuberculosis showed to what extent diseases of malnutrition had been repelled from the population. Notifications of tuberculosis among women aged 15 to 25, which were over 7,000 in 1931, were under 6,000 in 1937, and the heights and weights of school children continued the same tale.

SLEEP AS A FACTOR IN MALNUTRITION

Sir FRANCIS FREMANTLE said unquestionably an enormous improvement in health could be secured by a great increase in family income coupled with wisdom in using that increase. In the Rhondda Valley improvements in maternity services, medical services, hospital accommodation, and so on did not bring about any marked reduction in maternal mortality, but improvement in nourishment led to a remarkable reduction. The question was whether the Government should provide money for such an obvious solution. The amount required would be small compared with that spent on the defence services, but he thought there would not be a return if a great grant were to be made straight away. Much depended on improving the general conditions of home life. One of the factors in malnutrition was the lack of sleep for children. This might be due to lice infestation in the bed of the child, to noise in the street, to adults coming in carelessly, to the child being allowed to stay out until 10 or 11 at night, or to the radio being turned on until a late hour. Instead of the child getting ten hours' sleep it perhaps got only five or six hours.

Sir WILLIAM ALLEN said the corporation of Belfast had looked in vain for a place on which to erect a sanatorium for tuberculosis. If the money were spent instead on the provision of proper housing accommodation and on the burning of beds of poor people who died in their own homes from tuberculosis no sanatoria would be needed. The sale of such beds was still going on, and those who bought them also died after a few years of tuberculosis. Northern Ireland during the past ten years had erected airy schools, with plenty of playground, and had begun to provide nursery schools for children over 2 and under the compulsory school age who lived in districts where home surroundings left much to be desired. The improvement in the health of the children was manifest.

After Mr. Westwood had summed up for the Opposition, Mr. KENNETH LINDSAY said that if local authorities were given power to provide free meals for about one-third of the children purely on the income basis there would be no assurance that they would do it because they did not exercise their existing powers. Local education authorities were not responsible for poor relief or for feeding as such, but only for feeding children who were unable to benefit from education. If free meals were given by education authorities to all children below a certain income scale the Unemployment Assistance Board would be compelled to take that into account, and therefore the families would not be any better off. Automatic feeding of all children whose parents fell within a certain income figure was unsatisfactory, for it overlooked a number of children who were in need of education. There were still too many children who were unable to obtain the protective foods, and at times his patience got rather thin with authorities which might well put the milk and meals provisions into operation. Yet great progress had been made and the standards had improved. With regard to the question of diabetes raised by Mr. George Griffiths, he understood that any local authority could obtain sanction from the Ministry of Health to supply insulin free of charge to poor people suffering from this disease. The definition of poor rested with the local authority.

The discussion then closed and the Consolidated Fund (No. 1) Bill was read a third time.

Health Conditions in Wales

On the second reading of the Consolidated Fund (No. 1) Bill in the House of Commons on March 22 Mr. JAMES GRIFFITHS opened a debate on the Report of the Committee of Inquiry into the Anti-tuberculosis Service in Wales and Monmouthshire. He said the report had shocked the nation, yet in some respects it understated the problem. It revealed Wales as an impoverished nation. There were revelations of malnutrition, bad housing, poor schools, and inadequate social services. In 1936 the Ministry of Health conducted an investigation into the problem of maternal mortality in Wales. It showed that in 1924 to 1933 the maternal mortality rate in Wales exceeded the rate in England by 35 per cent. The present report showed that from 1930 to 1936 the average mortality rates from tuberculosis in the eighty-three county boroughs of England and Wales was 986 per million. Cardiff, Newport, and Merthyr exceeded that average. In the

same period the average mortality from tuberculosis in the counties of England and Wales was 724 per million. Only one county in Wales—namely, Flintshire—was below that average and twelve Welsh counties were above. Seven Welsh counties—Caernarvon, Merioneth, Anglesey, Cardigan, Pembroke, Glamorgan, and Carmarthen—occupied the highest places. These counties represented 80 per cent. of the population of the Principality, and each was on the black list for tuberculosis, for maternal mortality, and for overcrowding. Over 60 per cent. of all silicosis in the coalfields of this country was in South Wales, and the anthracite coalfield, which was only one-fortieth of the British coalfields, had more than half its silicosis. At Blaenau Ffestiniog 80 per cent. of the quarrymen over 40 years of age had silicosis. The report revealed a virtual breakdown of local government over wide areas in Wales.

APPALLING HOUSING CONDITIONS

Sir HENRY MORRIS-JONES said the report was distressing reading but might be in part a little melodramatic. The medical officer of health for South Carmarthenshire had contradicted it on questions of fact, but they were bound to admit that in the main the committee had established a serious position in the Principality in regard to tuberculosis. Tuberculosis was acquired and preventable and there was nothing racial about it so far as Wales was concerned. The damp climate of Wales, especially in the south-west, was slightly predisposing to it, but the main predisposing causes were those connected with occupation. The industrial areas of Wales had come out of the report surprisingly well, as did the county of Denbigh largely through excellent local administration. Flintshire also came out in a satisfactory manner. The number of people who died from tuberculosis in institutions in Wales was 16 per cent. of the total deaths from that disease, whereas in England the figure was 37 per cent. There was insufficient accommodation, or unwillingness on the part of people to go to institutions, or a lack of encouragement among the authorities to make use of its institutions.

The report exonerated the King Edward Memorial Association from any serious responsibility in regard to the difference in the mortality rates and the incidence of tuberculosis in Wales as compared with England, but this association, he thought, had not developed its educational work among the people of Wales as had been expected when the association was founded. Wales had large sanatoria in the north and south but few small institutions that would encourage people to be segregated early to avoid contacts and to get early treatment. Poverty might be a predisposing cause of tuberculosis, but the first main cause was found in appalling housing conditions in some parts of Wales. Nutrition was quite as serious as housing; the diet of some people mentioned in the report who could afford adequate nourishment was wrong. Children, especially in the rural areas, took with them an unsatisfactory midday meal lacking in the vitamins necessary to maintain health. These children should have an adequate midday meal, because the report revealed that the mortality was greater among young people from 15 to 25 than at the other ages.

Miss LLOYD GEORGE said that in Wales adequate action was not taken to deal with bad housing. As soon as one family went out of a condemned house in one town in Carmarthen another family came in, contrary to the instructions of the medical officer of health.

MINISTER OF HEALTH'S REPLY

Dr. ELLIOT said this was a debate on conditions in Wales and not merely upon tuberculosis. The cases which had been mentioned from Wales could be paralleled from Scotland. A report for Durham, for West Cumberland, or for other parts of the United Kingdom would not be so bad as this one in some particulars but would be worse in others. The review of Welsh conditions arose out of a committee appointed in 1937 to go over the work of the King Edward VII Welsh National Memorial. That committee was impressed with the efficiency of the work and found no evidence that it had been or was being carried out on extravagant lines. The committee gave accounts of the steps taken for treatment of tuberculosis, but drew attention to the fact that over large areas in Wales preventive duties had been neglected or carried out imperfectly by some local authorities. More strenuous efforts were required to secure examination by tuberculosis officers of all contacts and particularly of young adults. If all young contacts could be persuaded to attend for examination immediately the disease could be checked at an early stage and many lives could be saved. That was a matter for those who were leaders of the people and could not be enjoined by legislation. He had asked for the observations of the Welsh Board of Health on this report and also for those of local authorities. There was a reply to some of the things stated in the report and the local authorities should have opportunity of making their observations. It might be possible later to call a conference of the local authorities in Wales which he as Minister would attend.

As regards nutrition, attention had been drawn to the use of milk, and the report recommended that the freer use of milk, especially in the diet of children, could be encouraged. The committee drew attention to the fact that 47½ per cent. of children in elementary schools in Wales received a daily ration of milk, although that percentage was lower than in England. Progress was being made with the purity of the milk supply, and the number of attested herds in Wales had risen remarkably; between August, 1938, and the end of February, 1939, it had almost doubled.

Sir FRANCIS FREMANTLE asked whether Dr. Elliot said that attested milk was free from tubercle bacilli.

Dr. ELLIOT: Yes, certainly. The conditions at attestation included stringest rules to maintain the herd free from bovine disease. He was not talking of accredited milk. There was a difficulty in obtaining supplies of milk in some schools in Wales. The law did not compel people to send their milk away and it was up to the producers to see that the milk was available to those who needed it in the locality.

It had been pointed out in the debate that maternal mortality in Wales was higher than in England. That had always been true, but in Wales as in England maternal mortality was coming down. There was a better standard of midwifery in Wales than ever before, and there had also been much improvement in the provision of infant welfare centres. He dealt with the progress of housing in Wales and said that in respect of the county of Montgomery the Ministry had had conferences with the local authorities and two inspectors had visited it, one of whom had made a detailed examination. Last summer he himself had held conferences in all the rural areas, one of which was attended by nearly all the Welsh local authorities. More could be done by using facilities which Parliament had put at the disposal of local authorities. The best thing the Welsh people could do was to try to revivify their own country.

Dr. SUMMERSKILL said the report told of evidence that local authorities in some districts took no action for the disinfection of houses which had housed tuberculous people. It was known that six weeks after the death of a tuberculous person dust on the walls of the room in which the patient died still contained virulent tubercle bacilli. Was Dr. Elliot going to content himself with another inquiry and to leave these diseased traps to infect their next occupants?

Mr. KENNETH LINDSAY said there were 1909 public elementary schools in Wales and the majority were in satisfactory premises. There were sixty-nine on the black list which had not yet been dealt with, which was 3.6 per cent. of the total number in Wales. In the estimates which he would shortly introduce the figure for England and Wales for expenditure on meals and milk in schools would show an increase of £250,000. With regard to milk the county medical officer had to certify the milk, but there were places where both pasteurized and T.T. milk were unobtainable. The question of price was sometimes a difficulty. In Anglesey the children paid one penny instead of a halfpenny for a third of a pint and the county fed 2,000 children free at that double price, which was due to the fact that the milk was T.T. milk.

The debate then closed.

Medical News

The House of the British Medical Association, including the Library, will be closed for the Easter holiday from 5 p.m. on Thursday, April 6, to 9 a.m. on Tuesday, April 11 (Library, 10 a.m.).

The House and Library of the Royal Society of Medicine will be closed for the Easter holiday from Friday, April 7, to Monday, April 10, both days inclusive. The Library will be closed at 6.30 p.m. on Thursday, April 6, and on Tuesday, April 11.

The Minister of Health, the Right Hon. Walter Elliot, M.P., has accepted the invitation to act as president of the Public Health Congress to be held by the Royal Institute of Public Health and Hygiene at Hastings from May 23 to 27.

At the annual dinner of past and present students of the Royal London Ophthalmic (Moorfields) Hospital the toast of "The Hospital and Medical School" was proposed by the chairman, Mr. A. F. MacCallan; and Mr. Charles Goulden, dean of the medical school, in his reply, said that during the year 1937–8 104 new students had joined and seventy-five students remained from the previous year. One important change about to take place was the appointment of a full-time pathologist, with the aid of funds provided by the lay management of the hospital, supported by a grant from the school. The examination results had been satisfactory. Out of fifty-seven candidates who passed the D.O.M.S. examination twenty-nine were students at the school; and in the second part, of sixty-seven successful candidates forty-six had studied at Moorfields. At the D.O. examination of the University of Oxford, of eighteen successful candidates ten were students of the school. Two students had also obtained the F.R.C.S.Ed. in ophthalmology. The toast of "The Guests" was proposed by Mr. M. H. Whiting, and Sir Adolphe Abrahams replied. The health of the chairman was proposed by Mr. F. A. Juler.

Westminster Hospital has been promised a munificent gift of £25,000, one-quarter of the sum needed to complete its rebuilding fund. The donor, Mr. Bernard Docker, chairman of the hospital, has already given freely both time and money to this great enterprise. In making his gift Mr. Docker has expressed a hope that all who have at heart the cause of the sick, the progress of medical science, and the welfare of nurses will support him. The hospital is striving to complete the entire cost of rebuilding by April 20, the day upon which the King, accompanied by the Queen, will open the new main building. Mr. Docker's gift brings the fund within £40,000 of the total required. A grant of £15,000 from King Edward's Hospital Fund will be earned if the Westminster Hospital is opened free of debt.

Dr. Karel Frederik Wenckebach, formerly professor of medicine at Vienna, Honorary Fellow of the Royal College of Physicians of London and of the Royal Society of Medicine, and a Foreign Corresponding Member of the British Medical Association, celebrated his seventy-fifth birthday on March 24.

EPIDEMIOLOGICAL NOTES

Diphtheria in 1938

Provisional figures indicate that there was a slight increase in the incidence of diphtheria in 1938, as compared with the previous year, in Germany, Italy, England and Wales, Scotland, and the United States of America; but an appreciable decline was observed in the Scandinavian countries (Norway, Sweden, and Denmark) and to a less extent in Poland, Austria, Yugoslavia, Rumania, France, and Australia. The seasonal increase in the second half of 1938 was less marked than in the corresponding period of 1937 in France, England and Wales, Germany, Italy, and Poland, but the incidence of the disease in the last four countries remained considerably above the median values for the corresponding period of the years 1924–36. From these observations it would appear that the peak has been passed in diphtheria morbidity, which has affected most European countries and Japan and Australia since 1920. The incidence of the disease reached its maximum in the years 1934–7, but it did not approach the levels recorded at the end of the nineteenth century. During the years 1920–30 diphtheria mortality rose with the increase in morbidity, but no constant relation was encountered. For instance, whereas in England and Wales the diphtheria death rate has fallen since 1935 in sympathy with the decline in incidence during those years, in Germany an almost similar fall in the death rate was observed during the same years, despite a considerable increase in the incidence. A progressive decline in the death rate has been recorded in Norway and Sweden since 1920, in the Netherlands since 1930, in Germany, Austria, Rumania, and in England and Wales and Scotland since 1934.

Influenza

It appears that the incidence of influenza is declining in the majority of European countries. The peak of the epidemic, which has generally been of a mild character, was reached in January in Scotland, Hungary, Ireland, and Poland, during the first half of February in the Netherlands and Denmark, in the third and fourth weeks of February in Switzerland and Germany, and between February 19 and March 4 in England and Wales. During the present week (week ended March 18) deaths from influenza in the 126 great towns of England and Wales fell from 261 to 176, and the general death rate from 13.8 to 13.6. Decreases were reported in Greater London 96 (128), Administrative County of London 42 (75), Portsmouth 1 (8), Luton 6 (7), Rhondda 2 (7), Sheffield 4 (7), Leeds 2 (6), Southend 2 (6), Ipswich 4 (6). (The figures in parentheses denote the numbers for the previous week.) Deaths fell from 13 to 6 in Scotland, from 1 to *nil* in Eire, and remained at 1 in Northern Ireland.

In Germany during the week ended March 4 deaths from influenza in the 57 towns with a population exceeding 100,000 fell from 513 to 443, and deaths from pneumonia from 905 to 759, while the general death rate fell from 16.9 to 15.8 per thousand population. The largest number of deaths from influenza were recorded in Düsseldorf 33, Cologne 31, Hamburg 23, and Dresden 22.

Cerebrospinal Fever

In the last four weeks sporadic cases of cerebrospinal fever have appeared in South Wales, particularly in Monmouthshire, where numbers notified have been 2, 7, 6, and 2, respectively. The urban district of Risca has been affected most severely, there having been 7 cases to date, apparently without any fatalities. In England and Wales as a whole the incidence has not been higher than the average for this time of the year.

Returns of Births and Deaths in Eire

During the fourth quarter of 1938 13,340 births were registered in Eire—6,817 males and 6,523 females—representing a rate of 18.2 per thousand population, and 0.7 above the rate for the fourth quarter of 1937; of these, 420 births were illegitimate, equivalent to 3.1 per cent. of the total. During this period the birth rate for Northern Ireland was 18.8, for England and Wales 13.8, and for Scotland 16.7. Deaths numbered 10,194, equivalent to an annual rate of 13.9 per thousand population and 0.5 above the rate for the fourth quarter of the preceding year. In Northern Ireland the death rate was 13.7, in England and Wales 11.5, and in Scotland 12.8. Compared with the corresponding quarter of the preceding year there were fewer deaths from typhoid fever, measles, and scarlet fever, but more deaths from whooping-cough, diphtheria, and diarrhoea and enteritis in children under 2 years of age. The infant mortality rate was 66, compared with 69 in 1937, while the death rate from puerperal causes was 2.8, against 2.9 in the preceding year.

No. 11

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 18, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns (125 in 1938) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930–8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	36	6	8	1	1	41	4	11	1	—		
Deaths		1	1				5	2				
Diphtheria	972	94	203	48	23	1,556	159	261	61	44	1,155	159
Deaths	27	—	6	1	—	41	5	8	3	—		
Dysentery	28	2	15		—	125	20	50		—		
Deaths				—	—			—	—	1		
Encephalitis lethargica, acute	3	—	—	1	—	4	1	1		—		
Deaths		—					3	—				
Enteric (typhoid and paratyphoid) fever	10	—	4	8	3	17	—	7	7	—	22	
Deaths	2	—	—	—	—	—	—	—	—	—		
Erysipelas			81	3	6			84	10	5		
Deaths		—					2	—				
Infective enteritis or diarrhoea under 2 years	54	13	4	2	—	50	15	10	4	—		
Deaths												
Measles		34	124		—			1,547		106		
Deaths	7	2	—	1	—	66	18	24	—	8		
Ophthalmia neonatorum	88	13	24		—	118	15	34	1	1		
Deaths												
Pneumonia, influenzal*	1,205	151	17	5	6	1,409	110	9	3	20	1,413	117
Deaths (from influenza)	176	42	6	—	1	76	5	4	—	—		
Pneumonia, primary			196	18				279	10			
Deaths		39		12	5		26		22	16		
Polio-encephalitis, acute	—	—				1	—					
Deaths		—					—					
Poliomyelitis, acute	2	—	3		—	5	1	1		—		
Deaths		1					—	—				
Puerperal fever	—†	—	14		—	7†	7	17	3	1		
Deaths		—					—					
Puerperal pyrexia	173	11	24		1	193	14	17		2		
Deaths												
Relapsing fever	—	—			—	—	—			—		
Deaths												
Scarlet fever	1,739	148	276	38	54	2,307	189	404	61	80	2,311	222
Deaths	1	—	—	—	1	8	3	1	1	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—			—	—	—		
Whooping-cough		338	569		75			93		15		
Deaths	24	4	14	2	1	16	3	2	3	—		
Deaths (0–1 year)	383	57	58	34	17	408	89	88	34	21		
Infant mortality rate (per 1,000 live births)	59	48				68	73					
Deaths (excluding stillbirths)	5,527	1,215	679	182	154	5,225	1,042	719	222	161		
Annual death rate (per 1,000 persons living)	13.6	15.5	13.7	12.2	13.7	12.9	13.1	13.1	15.0	14.3		
Live births	6,022	1,009	861	321	227	7,022	1,364	961	304	243		
Annual rate per 1,000 persons living	14.8	12.8	17.4	21.6	20.1	17.3	17.2	19.6	20.5	21.5		
Stillbirths	238	34	41			249	35					
Rate per 1,000 total births (including stillborn)	38	33	45			34	25					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Snoring

"W. M. M." writes in reply to "Perplexed's" request for advice on snoring (March 25, p. 655): A shield can be made by a dental surgeon to fit between the teeth and the cheeks and lips. This shield worn at night prevents mouth breathing and so stops snoring.

William Hunter's Coins

Mr. W. R. LE FANU, M.A., Librarian of the Royal College of Surgeons of England, writes: William Hunter's coins, about which Dr. A. Piney inquires at page 656 of the *Journal* of March 25, are described in a pamphlet by Sir George Macdonald, *The Hunterian Coin Cabinet*, published in 1933 by Glasgow University, to which Hunter bequeathed all his collections.

Dr. F. PARKES WEBER writes: The Hunterian collection in the University of Glasgow, containing William Hunter's coins, is one of the best-known collections of Greek coins in the world. So far as I remember, the curator of the collection was president of the recent International Numismatic Congress in London.

Professor E. P. CATHCART also writes confirming that the coins along with the rest of William Hunter's books, pictures, etc., are housed in the Hunterian Collection in Glasgow University.

Treatment of Urticaria

Dr. J. J. HOGAN (Waterford) writes to suggest that "M.B." (February 25, p. 430) should try adrenaline.

Income Tax

"Z" has recently moved into a more expensive house. It was built as a doctor's house and has a special surgery; the hall is particularly large, and the drawing-room, and sometimes the waiting-room, are used for patients. The inspector of taxes considered one-fifth of the rental a sufficient allowance; later he offered two-fifths after discussion, but has now withdrawn that offer.

*** Definite advice is difficult in a case of this type, as so much depends on a detailed examination of the premises. Broadly, one-fifth seems insufficient, and "Z" should be allowed one-third or two-fifths as a basis. It has to be remembered that the ground floor is the highest-valued floor of the premises, and that the two-fifths, etc., has to cover the garage. A useful check on the estimate is to consider the *balance* of rent in relation to the private portion—that is, what would have to be paid for such accommodation if it stood alone.

Absence Abroad

"B. R. O." holds an appointment in this country, and will probably be absent from the United Kingdom for more than six months in the coming financial year. If so, will it affect his liability to income tax?

*** The six-months rule applies only to visitors to this country, and then only to income arising abroad. "B. R. O.'s" proposed absence will therefore not affect the amount of tax payable on emoluments arising from an appointment in the United Kingdom.

"E. F." inquires: What taxation does an American woman pay who is married to a British subject and resident in England?" The income is from American stocks held in the United States.

*** The husband is liable to assessment in respect of the income—that is, the amount of the dividends less the American tax payable thereon. Double income tax relief is restricted to income from British Dominions, Crown Colonies, etc., and does not apply to American income.

LETTERS, NOTES, ETC.

"Advice"

Dr. H. N. GARRUS (Hayes, Middlesex) writes: Within the last few hours a representative of a water-softening firm has made a verbal offer to pay me 10s. for every patient persuaded to buy one of these machines. I "advise" the rheumatic sufferer: the agent does the rest. Not so long ago an insurance company agent called and wished to make me an agent—not referee—who would be in a unique position to "advise" patients to take up policies, each of which would carry a commission for me. On another occasion another insurance company offered a medical refereeship, providing a personal policy was first taken out with them.

The Medical Register, 1939

The official *Medical Register* for 1939 has now been published on behalf of the General Medical Council by Constable and Co., Ltd. at 21s.; post free, 22s. 6d. The table printed in the introductory section shows that 2,365 names were added last year, the highest increment in any year since the three exceptional years 1923–5. New registrations numbered 1,150 in England, 590 in Scotland, 295 in Ireland, and 330 on the Colonial and Foreign lists. The total number of names on the *Register* at the end of the year was 61,420, representing an increase of 1,257. The number of names removed from the *Register* during 1938 was 1,142: of these, 1,003 were deleted on evidence of death; 132 for failure to comply with the inquiries of the registrar as to cessation of practice or change of address; and seven were struck off under the disciplinary powers conferred by Parliament on the General Medical Council. The average annual number of penal erasures during the past twenty years was five.

Disclaimer

Dr. SYDNEY A. OWEN writes: In a recent issue of the *Sunday Pictorial* there appeared a picture entitled "A Glass Case Saves a Tiny Life." In the letterpress below my name appears. I wish to state categorically that the publication of this picture with reference to me by name, was made without my knowledge or approval.

Corrigenda

An error was made in the issue of March 18, p. 563, in stating that *Public Health Services*, by Norman Wilson, is published by the University of London Press. William Hodge and Co. are the sole publishers of this volume.

On March 25 at page 645 it was stated, through a printer's error, that Dr. J. V. Mainprise treated a boy aged 10 with 5 grammes of sulphanilamide four-hourly. The dosage he gave was 5 *grains* four-hourly.

Colonel G. F. ROWCROFT writes: I regret that in my letter about sudden heart failure (March 25, p. 656) I mentioned the injection of "novocain" as a restorative. It was, of course, a *lapsus calami* for "adrenaline."